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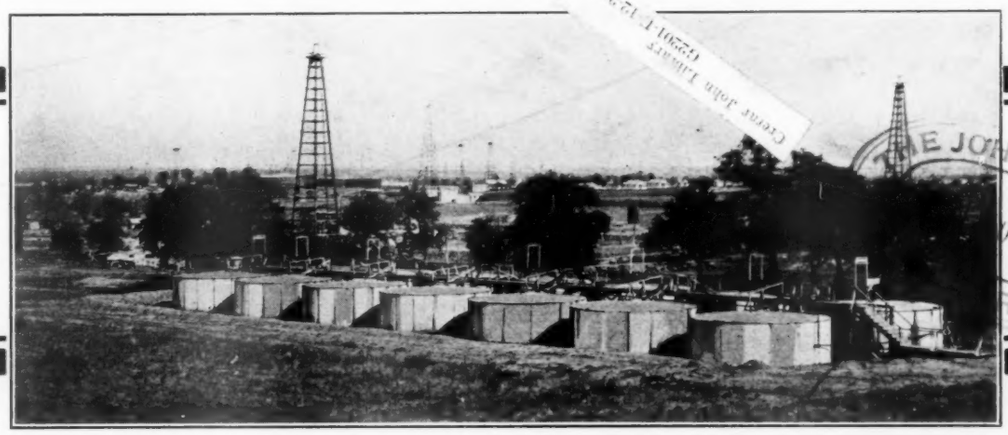

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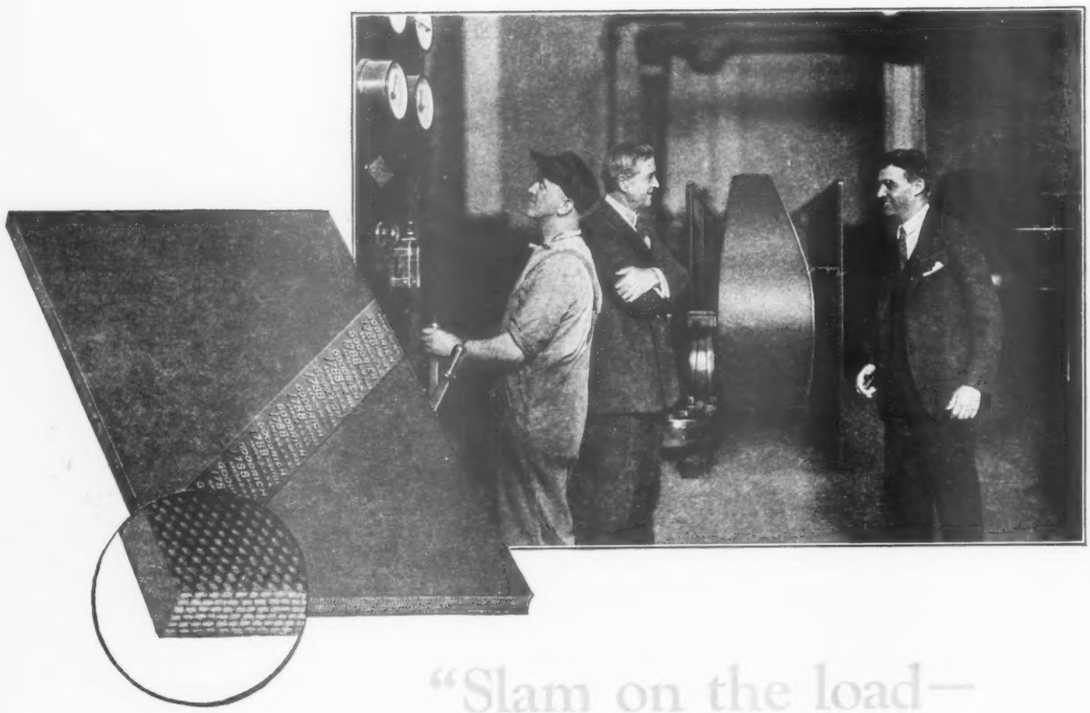

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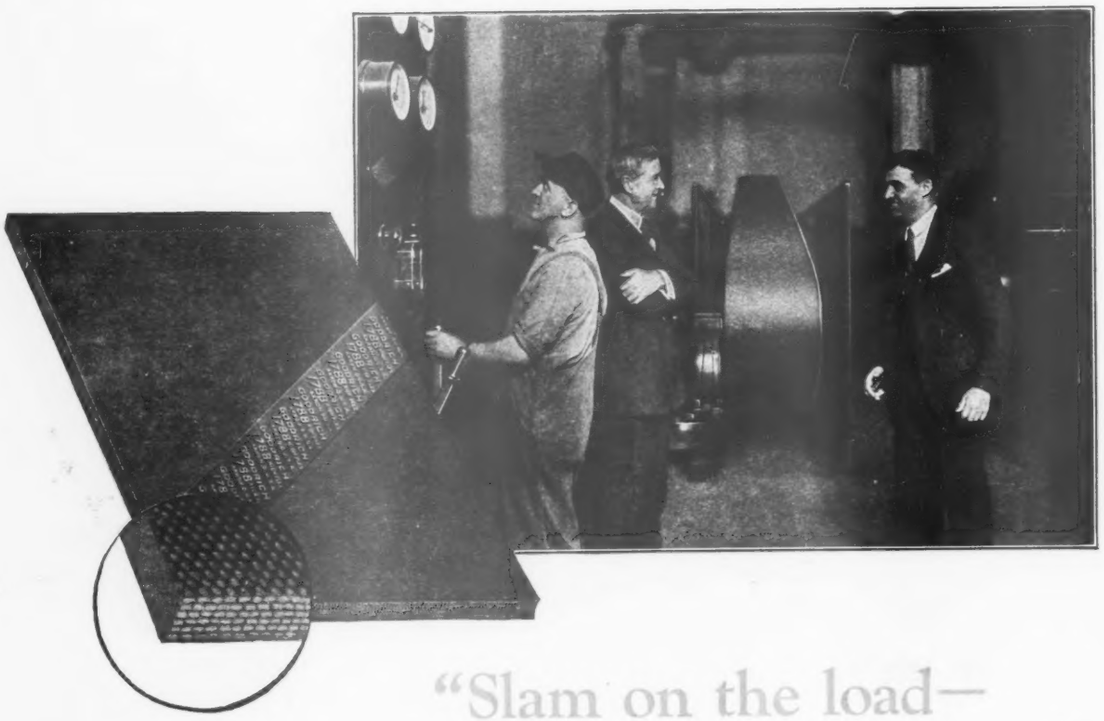

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"1788 Highflex" Belt

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The Oil and Gas Journal

PRODUCING REFINING MARKETING

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Good Demand for Crude Aids Situation

Highest daily average estimated total production in 1927, week ended July 30, 2,587,105 bbls. Lowest in 1927, Jan. 22, 2,360,789 bbls.

Pipe Line Deliveries Being Maintained With No Evidence of Slackening. West Texas Outlets Important Factor

By Andrew M. Rowley

Highest daily average estimated light oil production in 1927, week ended July 30, 2,102,385 bbls. Lowest in 1927, Jan. 1, 1,790,729 bbls.

Demand upon the part of eastern and middle west refineries for Mid-Continent crude is being maintained at a high level and deliveries by the pipe line companies show no evidence of slackening. This condition, with the continued decline in output of the greater Seminole area, provide the note of optimism prevalent through the Mid-Continent despite gains in West Texas production which are offsetting declines at Seminole. As a result there is a resumption of talk of higher prices, especially for light oils or those especially desirable for refining, the general situation being summed up in the expression: "Well, we are one day nearer an increase in prices."

A theory that the water encroachment in the Hendricks Pool, Winkler County, Texas, is due to edge water and that the structure there may cover considerably more territory than had previously been thought, is worth consideration, although it is believed construction of facilities for handling West Texas production will have a greater influence on the general price structure than the appearance of water in any of the pools. It is conceded West Texas will produce a great quantity of crude, regardless of water conditions, and making this crude quickly available to markets is a more important factor than the water situation.

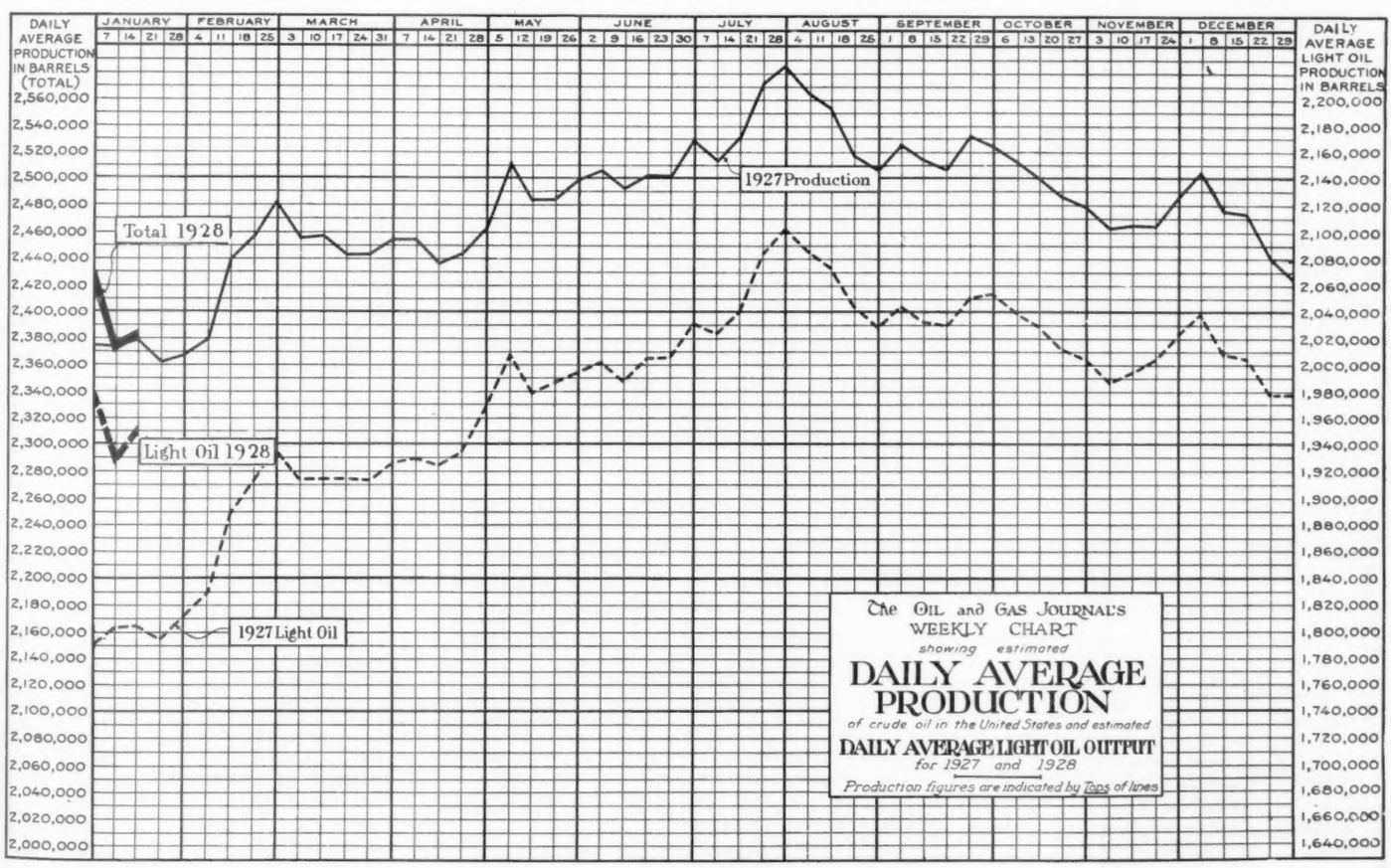
Seminole will continue to decline probably until next June, it being estimated production there may be around 280,000 or 285,000 barrels daily by March 1 when the present agreement regarding drilling in areas where production has been found in wildcat tests, expires. It must be kept in mind, however, it is probable that early in June that area will begin to register substantial increases in light oil production. Also that by that date or a little later, facilities for handling West Texas crude will be much greater than at present. And, also, that California's production probably will be greater than at this time, the decline there last week being due chiefly to taking wells off production to deepen them.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended January 14, and a comparison with the previous week follows:

	Jan. 14		Jan. 7	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	14,915	.....	14,985	.....
Burbank	37,045	.....	37,015	.....
Other Osage Fields	29,785	.....	29,755	.....
Cushing and Shamrock	21,040	.....	20,985	.....
Bristow and Eastern Bristow	24,445	.....	24,455	.....
Cromwell	10,695	.....	10,540	.....
Garber	10,015	.....	10,110	.....
Blackwell-Braman	8,985	.....	8,620	.....
Seminole	344,510	.....	337,915	.....
Wewoka	8,770	.....	8,970	.....
Northern Miscellaneous	112,840	.....	111,785	.....
Southern Fields	60,190	.....	59,940	.....
Total Oklahoma	683,235	.....	675,075	.....
North Louisiana	37,675	7,740	36,985	7,620
Arkansas	21,340	68,605	21,140	69,000
North Central Texas	127,063	.....	129,040	.....
West Texas	281,654	.....	260,758	.....
Texas Panhandle	74,725	.....	76,670	.....
East Central Texas	26,661	.....	28,864	.....
Kansas	105,710	.....	107,310	.....
Total Mid-Continent Area	1,358,063	76,345	1,335,842	76,620
Gulf Coast	.....	119,496	.....	126,315
Southwest Texas	.....	27,131	.....	27,170
Eastern	111,000	.....	111,000	.....
Rocky Mountain Area	78,124	.....	77,718	.....
California—				
Santa Fe Springs	38,500	.....	38,500	.....
Long Beach	116,000	.....	119,000	.....
Torrance	3,000	17,000	3,000	17,000
Huntington Beach	59,500	.....	60,000	.....
Dominguez	13,500	.....	13,750	.....
Rosecrans	8,500	.....	8,500	.....
Inglewood	19,500	12,000	19,500	12,000
Ventura Avenue	52,000	.....	52,000	.....
Seal Beach	40,500	.....	40,000	.....
Remainder of State	52,000	184,000	55,000	186,000
Total California	403,000	213,000	409,250	215,000
Total United States	1,950,187	435,972	1,933,810	445,105
Grand Total	2,386,159		2,378,915	

Total Increase, 7,244 Bbls.; Light Oil Increase, 16,377 Bbls.



Better Feeling in Oklahoma Market

Many Refiners Storing Surplus Gasoline in Expectation of Better Prices. Natural Gasolines Firmer. Other Products Unchanged

By W. T. Ziegenhain

Oklahoma refined oil prices remained unchanged, in general, as the slow domestic movement of light oils was balanced somewhat by increased shipments for export. Gasoline continued to be sold at prices covering a relatively wide range and this might be taken as indicating a renewal of confidence in the future of that market. The larger refining units are storing a portion of their production, refusing to sell at the present low of the market. While this practically eliminates them from the spot business in the differential territories and restricts spot trading to local deliveries, it is giving other refiners an opportunity to place their stocks in a better position and the stage will be set for a gradual strengthening, just as soon as the seasonal slump in consumption gives way to renewed buying.

No one expects a sharp advance nor any great advance until crude prices are revised upward but general conditions are slowly improving from the standpoint of crude production and more stabilized tank wagon prices and a conservative program of refinery runs should place refiners in a stronger position to advance prices. Export inquiries for gasoline, particularly the 60-62 390 and the 400 endpoint grades, helped to hold prices at last week's level, but in general these were more freely offered than the U. S. Motor grade. Export shipments amounting to more than 1,000,000 gallons of the 60-62 390 endpoint gasoline were made from North Texas at a price of 6¼ cents and inquiries for U. S. Motor gasoline, kerosene and other oils were made, much of the material to be moved to Spain to apply on the contract made with the Spanish government by the Petroleum Export Association, Inc. The Atlantic Refining Co. was also said to be making inquiries for kerosene. These factors helped to give Oklahoma sales managers a more optimistic feeling.

REFINED MARKET BAROMETER

Refined oil prices were generally lower in California with the market continuing heavy in other sections, but without price changes. Gasoline weakened along the Pacific Coast and prices along the Atlantic Coast were threatened as lower retail prices were posted as a result of increased imports of foreign gasoline. The Mid-Continent market showed more stability as some refiners chose to store their production in anticipation of higher prices, thus relieving the market of much material. Natural gasoline prices declined in California but the A and AA grades were quoted at higher levels in the Mid-Continent. The outlook is for a generally stronger market in the near future. Distillate moved slowly and prices were unchanged. Kerosene remained firm in all sections but showed no tendency to advance. Gas oil was generally stronger with higher prices being posted in the Mid-Continent. Fuel remained very heavy and concessions were reported along the Atlantic. While the Mid-Continent fuel market was improved by the elimination of distress material, there was still plenty available and only a slight advance could be expected. The lub market remained unchanged. Wax inquiries increased and quotations were advanced on some inquiries. Higher prices are expected within the next few days.

Mid-Continent—Gasoline prices covered a wide range but the general situation was improved by some of the larger refiners storing a greater portion of their production and quoting higher spot prices. Kerosene remained unchanged. Gas oil and fuel oils were strengthened by the greater demand. There is also a tendency for refiners to burn oil instead of gas, thus decreasing the amount for sale. Lubs remained unchanged as wax prices were advanced, reflecting the stronger eastern market.

Pennsylvania—Consumption of gasoline, kerosene and fuel oil continued good but prices were unchanged. Cylinder stocks weakened slightly. Wax strengthened as export inquiries were received.

Atlantic Seaboard—Gasoline imports threatened refinery prices but good weather permitted a high consumption and prices were unchanged. Kerosene was firm while gas oils demands increased. Bunker fuel oil was reported selling below the general market in a few cases and lower prices might result in the immediate future. Lubs were unchanged while wax inquiries tended to raise prices.

Chicago—Gasoline moved slowly but last week's prices were unchanged. Kerosene and distillates were in little demand as a result of the warmer weather. Gas oil inquiries gave that market greater activity. Fuel oil remained weak.

California—Lower prices prevailed in the gasoline, natural gasoline and fuel markets.

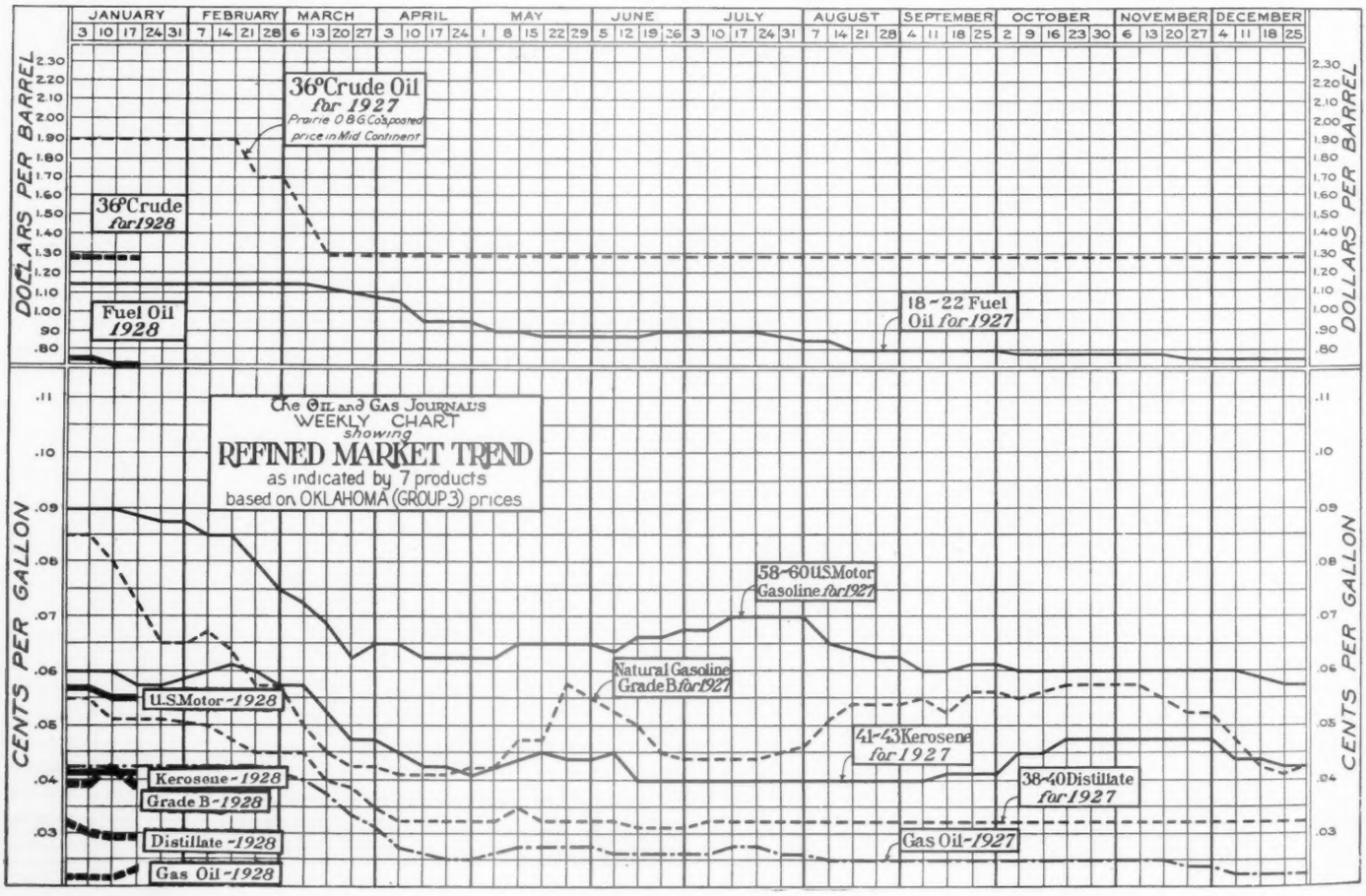
Houston—Export movement of lubs featured the trading and stability is given the market through this relief. Fuel oil was unchanged with several refiners burning a large share of their production instead of gas.

Natural Gasoline Stronger

Natural gasolines were tighter than at any time during the last few months and while there was plenty of material available, manufacturers feel their product stands a very good chance of advancing in price. Contracts carrying a large share of the material to the Gulf are calling for a maximum amount and several of these purchasers are in the spot market also, anticipating a stronger market in the near future. While these Gulf Coast shipments have removed a large share of the production of many manufacturers, some of the large manufacturers and marketers are now buying material on the open market, storing a portion of it. Several of these are already well taken care of by contracts and expect to continue to buy on the open market to help fill these over the year. Natural gasoline production in the Seminole is being better taken care of than ever before and should production there materially decline, manufacturers would find themselves in a very good position to force prices up on a level with U. S. Motor prices and possibly higher.

The kerosene market continued to be inactive, but refiners were unwilling to shade their prices. There was only a small amount of business, which usually went to refiners regularly supplying these

(Continued on Page 102)


JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER
DOLLARS PER BARREL
36°Crude Oil for 1927
Prairie O & G Co. posted price in Mid Continent
36°Crude for 1928
Fuel Oil 1928
18-22 Fuel Oil for 1927
CENTS PER GALLON
The Oil and Gas Journal's WEEKLY CHART showing REFINED MARKET TREND as indicated by 7 products based on OKLAHOMA (GROUP 3) prices
58-60 U.S. Motor Gasoline for 1927
Natural Gasoline Grade B for 1927
41-43 Kerosene for 1927
38-40 Distillate for 1927
Gas Oil-1927
U.S. Motor-1928
Kerosene-1928
Grade B-1928
Distillate-1928
Gas Oil-1928

Federal Oil Board Warns Industry

In Report on Substitutes Says It Will Make Certain Specific Recommendations if Practical Conservation Is Not Adopted

All previous records are being broken in oil production and oil consumption. This great and unexpected increase in the output of American oil wells must be credited largely to the recent advances in the technique of finding oil deposits and especially of producing the oil after it has been found. The newly found pools which have so markedly increased the present output of Oklahoma, Texas and California have been developed at a speed hitherto unknown, and the new rate of production under improved methods, however, only forecasts the earlier exhaustion of each field. Appreciation of oil conservation as a business policy has influenced the adoption of production methods which, it is hoped, promise larger ultimate recovery, but the one assured and significant fact in the production situation of today is the sharply accelerated rate of drawing upon the underground reserves.

This fact that new oil pools are being drilled and drained more rapidly than ever before simply foreshadows more sharply the ultimate fact that the time may come when substitutes for motor fuel may be necessary. It is therefore, desirable to survey the outlook for possible substitutes; indeed, a supply of raw material adequate to supplement crude oil must be ready whenever the petroleum output from domestic and foreign wells ceases to keep pace with the increasing demand.

Future Demand

In any outline of this economic problem of substitutes, it is of fundamental importance to know what is to be the nature of future increase in demand as well as of future decline in supply. An oil famine is not imminent, but prudence must always envisage the possibility of an oil shortage. When the peak of production in this country is finally reached, a more or less sharp decline may be expected, modified somewhat by the degree of efficiency in production methods then attained and by the prices then in force. Increase in price which will come with any diminishing supply will have a conserving effect on consumption and tend to reduce demand. The most that we can forecast at present is the trend in petroleum supply and demand, placing some emphasis on the extent of the present demand for crude oil and the consequent magnitude of the task of meeting it even in part by raw material from other sources.

During 1926 the average daily domestic demand for crude oil was slightly over 2,000,000 barrels, and the operators not only fully met this demand but produced a 25,000,000-bbl. surplus for the year. However, if imports and exports of all oils are counted, total stocks were reduced by 25,000,000 bbls. during the year. Two million barrels, then, was roughly the daily amount of domestic crude petroleum run to stills, so that 2,000,000 bbls. is a minimum measure of the present daily demand to be kept in mind when substitutes for crude oil are considered. In terms of motor fuel, the country's daily requirement last year averaged slightly over 800,000 bbls. of gasoline, and of the total domestic consumption the benzol used in blends amounted to less than 1 per cent, but natural-gas gasoline augmented the supply about 10 per cent.

Climbing Rate of Consumption

The available horsepower of the automotive engines that now consume 750,000 bbls. of gasoline a day has been estimated as possibly three times that of the installed capacity of all the other power plants of the country, both stationary and locomotive. Not only is this automobile equipment an index of present-day standards of living in the United States, but the assurance of its operation through future years naturally forces a consideration of the question of fuel supply. What are the substitute motor fuels in sight with which to offset any deficit in gasoline refined from petroleum? And what possibility is there that more efficient use may check the climbing rate of consumption?

Although with the manifold application of power to daily life the need of effective lubrication creates a nation-wide demand, which is met chiefly by petroleum products, the problem of lubricating oil is not so serious as that of motor fuel because adequate quantities of lubricants and other products could be made from much smaller quantities of crude oil than are produced at present. Indeed, the present output of crude oil could supply four or five times the present requirements of lubricating oil, mostly at the expense of the fuel oil fraction. Nor does the future supply of fuel oil present itself as an urgent matter, for a return to coal is the obvious solution of that problem, whenever consumers become unwilling to pay the increasing differential in price. Fuel oil has hitherto been marketed as a surplus product in competition with coal and with itself and at a price below its relative value for manufacture into gasoline. Thus, fuel oil is now the competitor of crude oil as raw material for the production of gasoline to meet the increasing demand, which is now declared to be "the main annual task of the petroleum industry." The operation of the law of demand and supply thus promises to effect the desired conservation in use by restricting the consumption of fuel and promoting its diversion to superior uses, chief among which will be the production of gasoline.

Oil Shale

Among the substitute sources of oil from which to supplement a failing supply of petroleum from wells most attention has been given to the oil shales, which are found in both the eastern and western parts of the United States. The adequacy of the supply of these shales as raw materials for the extraction of oil is now beyond question, as is demonstrated in the estimate of their possibilities by Dean E. Winchester, of Denver. (Appendix I) Mr. Winchester has had a wide experience in the field examination of these shales, first as a government geologist and later as a consulting geologist, and for this reason his testimony was requested for the information of this board.

Mr. Winchester's estimate of recoverable oil from oil shales, if and when the price warrants its extraction, is 92,000,000,000 bbls., or nearly 10 times the total quantity of the well oil that has been produced in the United States to date.

The question of cost of producing oil from oil shale presents a wide field for speculation and discussion. A statement of the problem and the facts thus far determined is given by the Bureau of Mines of the Department of Commerce in Appendix 2. As yet, experimentation on a large scale has not gone far enough to warrant any statement as to probable costs, although claims have been advanced by others that oil can be produced from shale at a cost equal to or less than the present price of crude oil at the wells. Other claims have been made that oil from shale can not be profitably produced until the price of well oil reaches a figure two to five times higher than at present. The question of the cost of producing shale oil can not be answered until operations have been conducted on a commercial scale.

Question of Mining

There is wide speculation as to the method of mining that will be most practical; whether selection mining should be followed and only the richer material extracted or whether it would be better to remove all grades of shale for a thickness of 200 to 500 feet by steam shovel operations or by caving methods. In many places surface mining is out of the question due to the thickness of overburden. Estimates on the cost of mining range from as low as 40 cents a ton for steam shovel operations to as high as $2.50 a ton for selective mining. Again, the figures on mining costs are too meager to be used for arriving at conclusions as to costs in large-scale operations.

There are many problems to be solved in connection with the retorting of oil shale and the refining of shale oil before an oil-shale industry could be established on a sound basis. Although the type of retort that is used in Scotland is admirably suited for the shales of that country, it is not certain that it will be economically practical for retorting American shales. On the other hand, none of the retorts of American design have been used extensively enough to determine their adaptability to the different grades of shale. It is believed that the work conducted by the Bureau of Mines at its experimental oil-shale plant on the naval oil shale reserve in western Colorado will answer a number of questions as to the proper design of retorts for treating American shales, and the tests made at the experimental refinery will furnish information on the methods to be followed in refining shale oil.

Transportation Problem

Since the richest and most extensive deposits of oil shale are in the sparsely settled sections of western Colorado, eastern Utah, and southern Wyoming, the problem of transportation becomes of extreme importance. It will not only be difficult to reach some of the deposits by railroad, but the crude oil or refined products will have to be transported long distances to reach important marketing centers. The question of water supply and the disposal of spent shale must likewise be given consideration.

Oil shale operations, in order to be profitable, doubtless will have to be conducted on a very large scale, involving a probable capital outlay of several million dollars for a single commercial plant. Unlike the oil industry, where a man with small capital, by making a strike can often obtain a quick return of many times the capital invested, the oil shale industry is likely to be a large-scale manufacturing industry with a small profit per ton of material treated. Although the industry, when once established, will doubtless pay a fair return on the capital invested, it may be difficult to finance operations until the supply of crude oil is definitely on the decline or until the demand exceeds the supply over a period of years.

Oil shale can not be considered as an immediate source of oil, either for displacing oil from wells or for supplementing the production from wells, except to a very limited extent. It should be considered as an important oil reserve, to be drawn upon if and when conditions become such that operations can be con-

(Continued on Page 148)

Board Issues Second Report; Third Section Being Prepared

WASHINGTON, D. C., Jan. 16.—Secretary of the Interior Hubert Work, chairman of the Federal Oil Conservation Board, today made public the board's second report dealing with "Possible Substitutes and Shale Oil Development."

Secretary Work announced that a third report, presenting a world-wide survey of petroleum resources, is in the course of preparation, but will not be completed for some months. The first report treated of "general petroleum conditions in the United States," and was issued under date of September 6, 1926.

As a foreword to the report just transmitted to President Coolidge, Secretary Work says:

"The President of the United States, in designating four members of his Cabinet to conduct a comprehensive study of present and potential petroleum resources of the United States, with a view to practical conservation, stated in his letter of appointment, dated December 19, 1924:

"'It is evident that the present method of capturing our oil deposits is wasteful to an alarming degree in that it becomes impossible to conserve oil in the ground under our present leasing and royalty practices if a neighboring owner or lessee desires to gain possession of his deposits.

"'I am advised that our current oil supply is kept up only by drilling many thousands of new wells each year and that the failure to bring in producing wells for a two-year period would slow down the wheels of industry and bring serious industrial depression. The problem of a future shortage in fuel and lubricating oil, not to mention gasoline, must be avoided or our manufacturing productivity will be curtailed to an extent not easily calculated.'

"The Federal Oil Conservation Board has rendered one report, treating of general petroleum conditions, and the present report deals with possible substitutes and shale-oil development. The third report will present a general survey, world-wide in character, of oil resources, present and potential.

"Following the completion of its third report, this board will, if in the meantime practical conservation measures have not been adopted by both Government and industry, make certain specific recommendations to the President of the United States, designed to further safeguard the country's natural petroleum resources."

Hendricks May Cover 17,000 Acres

Under Theory Advanced, Water Showing Is in Edge Wells of Big Structure and Therefore Not Vitally Important

Two factors in the West Texas situation are of paramount importance to the petroleum industry as a whole—adequate outlets to markets for the production and water encroachment. Both will wield a great influence this year on conditions in all areas, although it is probable the extension of facilities for handling the crude brought to the surface will have more bearing upon the price structure than water encroachment in the Hendricks Pool of Winkler County or increased water production in other pools in that territory.

In this connection a theory advanced by a Tulsa geologist and given weight by records of wells already drilled in the Hendricks Pool, is worthy of earnest consideration at this time. It is that the water encroachment experienced in wells in the Hendricks Pool is due to these wells being located on the edge of the pool and the water is edge water. He believes the structure slopes upward to the east from the producers on the Grisham-Hunter lease and downward to the west where the Amerada Petroleum Corp. has its big gas well on the J. B. Walton lease, these being shown on map on opposite page.

If his contention is correct and the Amerada well is located on the same structure as the other wells producing in the pool, the Hendricks Pool might cover approximately 17,000 acres as shown within the contour line on the map on the opposite page. Of greater importance is the fact that if this theory is correct, the present water encroachment means comparatively little and is no more than should be expected. Also that the center of the pool, outside this edge water area, might cover approximately 10,000 acres.

Based on Well Records

The well of the Amerada Petroleum Corp. in the SW NW Section 48 of Block 26 found the top of the lime at 498 feet above sea level and is making from 60,000,000 to 100,000,000 feet of gas and has not as yet been drilled to where the oil pay is expected. The Texon Oil & Land Co.'s No. 2 Grisham-Hunter-B in the NE NW SW of Section 45, Block 36, topped the lime at 405 feet above sea level. The Atlantic Oil Producing Co. and Collett's No. 1 Hendricks-F, in the NE NW NW Section 40, Block 26, topped the lime at 413 feet above sea level. It is reported the well of the Southern Crude and Westbrook in Section 47, offsetting the Amerada gasser, found the top of the lime a little higher than in the Amerada well, further bearing out the theory the structure slopes upward to the west there.

Naturally, the accuracy of the theoretical contour line shown on map on the opposite page can only be determined when tests are drilled in other sections of the area, but the records of the wells mentioned and those already producing in the southern and western part of the territory included within the contour line certainly seem to make the theory outlined "as good a guess as the next."

The appearance of water in a new field is always the signal for a general alarm. Despite the fact that oil, gas and water are found associated with each other, the encroachment of the latter in unduly large quantities causes natural misgivings.

Situation in Yates Pool

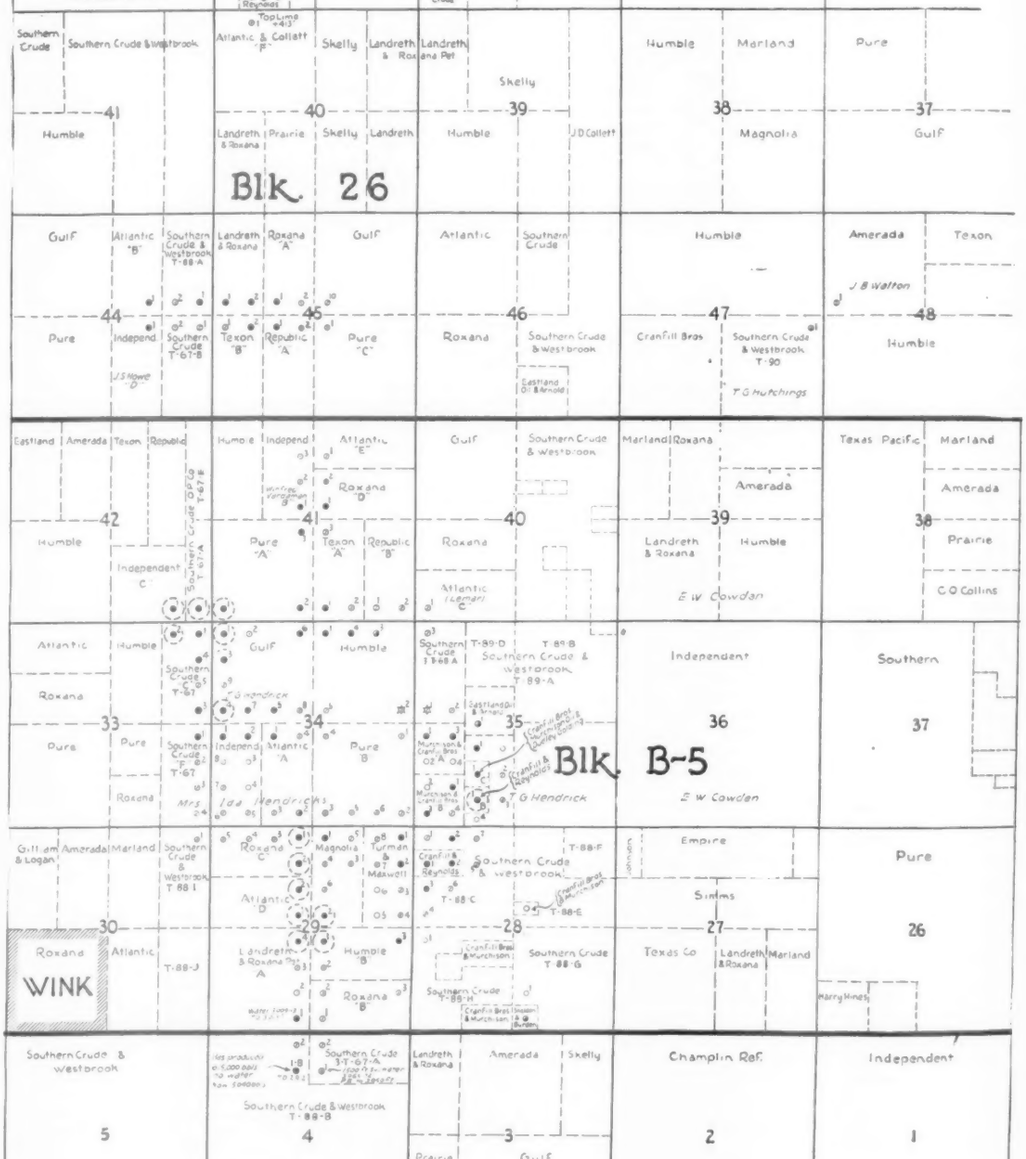
When some producing wells on the eastern edge of the Yates Pool of Pecos County, known to be structurally low, began showing water last September 17, there were many who immediately consigned that prolific shallow field to the classification of relatively unimportant areas. Still, the Yates Pool produced 3,635,000 bbls. in the three months of October, November and December, with the wells choked down to a fraction of their normal output. At present, it is flowing approximately 45,000 bbls. daily and the water has shown practically no tendency to migrate up the structure. The latter part of last week, some wells on the extreme northwestern edge of the field began showing water, but these, too, are situated pretty far down on the western flank of the fold.

The Big Lake Pool of Reagan County is producing from a tighter lime than the Yates Pool but the history of Big Lake has some bearing on the probable future behavior of the newer discovery. In the early part of 1925, the Big Lake wells were averaging about 6 per cent water. Now the average is about 20 per cent. The same hue and cry that was raised over the appearance of water in the Yates Pool was also raised when the news became generally known that most of the Big Lake wells were making water three or four years ago.

The Hendricks Pool of Winkler County is more comparable to Big Lake in the porosity of the producing lime than is the Yates Pool. Like the Big Lake structure, the Hendricks fold seems to be cut up by fissures and cross folds so that the water level is irregular.

During the past week a well on the east side of the southern part of the Hendricks Field, and situated on the plus 473-foot contour, was drilled into water. Roxana Petroleum Corp.'s No. 1 Hendricks-C, the big well which came in November 20 for 980 bbls. the first hour from 2,885 feet, was also added to the list of water wells last Friday, having started cutting about 3 per cent at that time. Saturday morning's gauge on this well was 3,520 bbls. of which 3 per cent was sulphur water.

As can be seen on the map on this page, the Roxana's No. 1-C is situated just half a mile north of the cluster of wells which originally started the water troubles the latter part of December. Roxana's No. 2-C, one location south of it, came in last week for 320 bbls an hour, but showed 33 per cent water when opened up and is now being plugged back



Hendricks Pool, Winkler County, Texas. Wells marked with circles are making more than 1 per cent water.

from its total depth of 2,989 feet. It is thought that the bottom water in this well can be successfully plugged off, since it is 104 feet deeper than No. 1-C.

Water Encountered Deep

The eastern edge well referred to above is Cranfill & Reynolds' No. 1 Hendricks-B in the center of a 10-acre tract located in the SW of Section 35, Block B-5, about a mile northeast of the water wells in Section 29. This news would be more encouraging for the market outlook, and more discouraging to the companies and individuals who own leases and royalties in the field were it not for the fact that the water was encountered at a depth of 3,080 feet, more than 700 feet below the top of the Big Lime and 251 feet below sea level.

This well made 160 bbls. of oil and 10 bbls. of sulphur water at 3,080 feet last Thursday. Elevation is 2,829 feet, top of lime 2,356 feet and top of pay 2,845 feet. This well was drilled in with rotary tools and may be a bigger well than it looks at present. It will be given a shot of 180 quarts to see if it can be loosened up.

Murchison Oil Co. and Cranfill Brothers' No. 3 Hendricks-B, located in the SW cor. SW SW of Section 35, just a quarter of a mile west of Cranfill & Reynolds' No. 1-B, was shot during the past week with 200 quarts from 2,850 to 3,050 feet and started flowing 125 bbls. an hour afterward. Saturday morning's gauge on this well was 2,315 bbls. Prior to the shot it was a very small well and part of the increase is thought to be due as much to cleaning the rotary hole as to actual loosening of the formation.

The Hendricks Pool was, in effect, extended to the northward about 1½ miles this week when Atlantic Oil Producing Co. and Collett's No. 1 Hendricks-F, in Section 40, Block 26, topped the lime at 2,435 feet, which is high enough to show that the contours within which production may reasonably be expected continue to the northward a considerable distance. Surface elevation of this test is 2,848 feet and that makes the top of the lime 413 feet above sea level.

Field Extending North

Atlantic & Collett's No. 1-F is 5 miles northwest of the southernmost producing well in the field, and due to its structural position there is every reason to believe the producing area of the Hendricks Pool will extend several miles farther north of it. Considering the great length of the structure, it is quite easy to visualize its width as great enough to take in the Amerada Petroleum Corp.'s No. 1 Walton in Section 48, Block 26, now just 2½ miles east of production. This well is still running wild, flowing several thousand barrels of salt water and from 60,000,000 to 100,000,000 feet of gas from a total depth of 2,411 feet. A steel rig has been built to replace the one which was demolished last week when the tools and 700 feet of pipe were blown from the hole, and an attempt is being made to skid the rig over the hole.

Several excellent producing wells were brought in during the past week, one of the best having been Roxana Petroleum Corp.'s No. 1 Hendricks-D, SW cor. S half NE, Section 41, Block B-5, an east offset to Independent Oil & Gas Co.'s No. 1 Vardeman-B. Roxana's test topped the pay unexpectedly at 2,790 feet, with surface elevation of 2,835 feet and ran wild for a time. It was estimated making 1,000 bbls. an hour, but was soon brought under control and was flowing 1,972 bbls. Saturday through a five-eighths inch choke.

Texon Oil & Land Co.'s No. 1 Hendricks-A, SW cor. SE Section 41, has increased rapidly the past week to 4,000 bbls. daily. Total depth is still 2,941 feet, according to the log, but the well has probably drilled itself deeper. This is the old gasser which mystified everybody a few months back on account of the fact that it hit the lime "higher than a cat's back" but made only gas. The trouble was then it was not drilled deep enough, having been temporarily completed at 2,814 feet.

Humble Oil & Refining Co.'s south offset to it, No. 1 Hendricks-A, flowed 282 bbls. per hour January 10 at 2,927 feet. Saturday this well was flowing into the same tanks with No. 4, and was pinched through a seven-eighths inch choke, while No. 4 was pinched through a three-quarter inch choke. Both of them together made 3,341 bbls. under those restraints.

Pure Oil Co.'s No. 3 Hendricks-A, NE cor. SW Section 41, Block B-5, southwest diagonal offset to Roxana's No. 1-D, previously mentioned, came in Sunday morning flowing 4,000 bbls. of oil. Drilling was stopped at 2,759 feet, where it was making 60,000,000 feet of gas and the well probably drilled itself in.

Hendricks Pool Output

Production of the Hendricks Pool amounted to 83,092 bbls. Saturday morning. This volume of crude was contributed by 51 wells. It was divided as follows by companies:

Company—	Wells	Bbls.
Atlantic	5	7,086
Cranfill & Reynolds	2	5,913
Gulf	5	6,393
Humble	4	7,584
Independent	5	12,681
Landreth & Roxana	3	8,810
Magnolia	2	2,900
Murchison et al	4	2,720
Pure	3	1,457
Republic	1	3,240
Roxana	3	7,301
Southern crude	11	11,824
Texon	2	4,378
Turman & Maxwell	1	825
Total	51	83,092

Handling 285,000 Bbls. Daily

It has been estimated West Texas may have outlets to handle 481,000 bbls. daily by July 1 next. This estimate is based on present pipe line and railroad facili-

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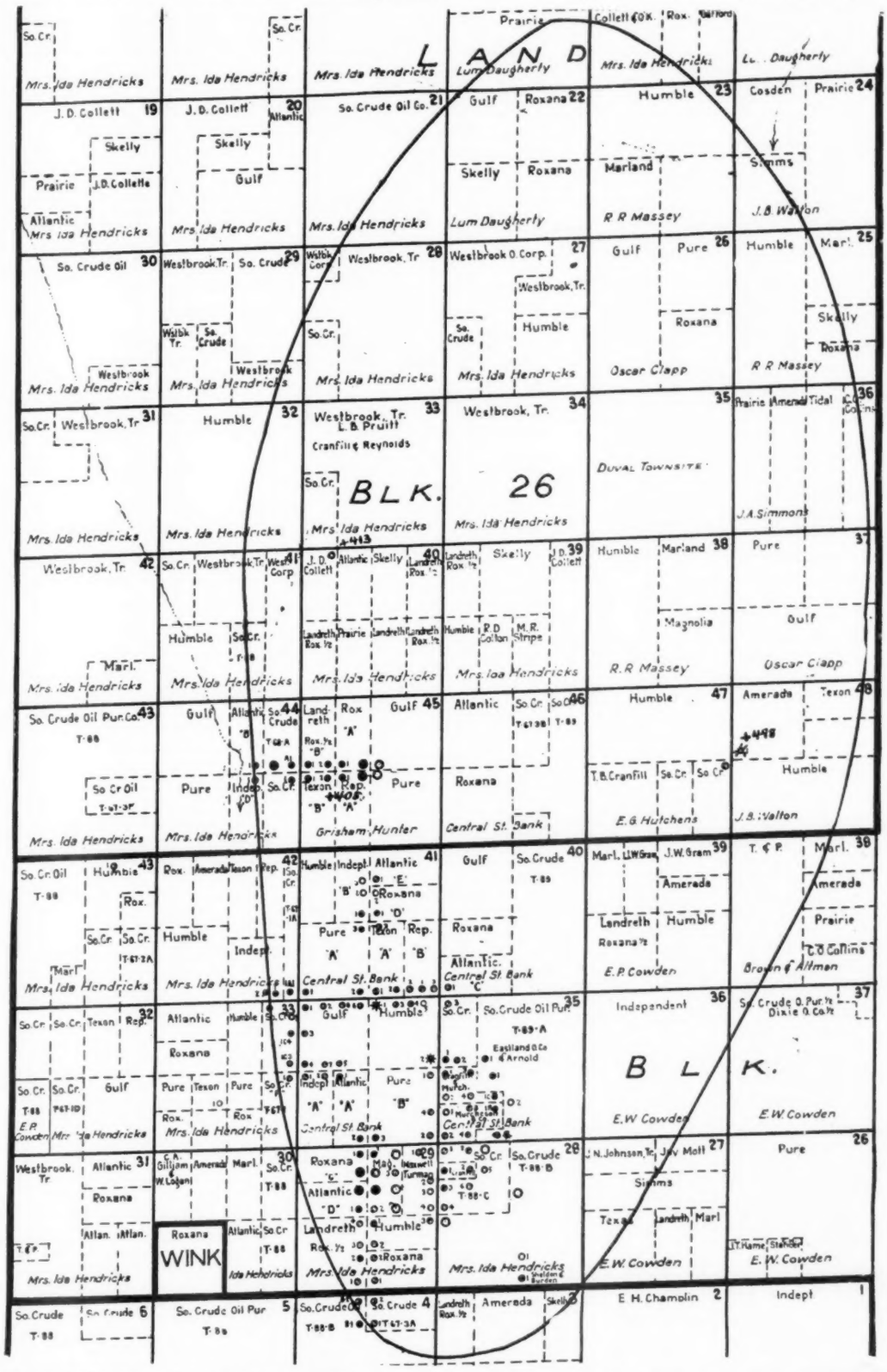


Theoretical contour line based on assumption the Amerada Petroleum Corp.'s gasser is on same structure as other producing wells in Hendricks Pool, Winkler County and that wells showing water are edge wells.

New Pools in North Central Texas

Southeast Archer County Has First Wildcat Producer of Year. Coleman County Well Completed Making 320 Bbls.

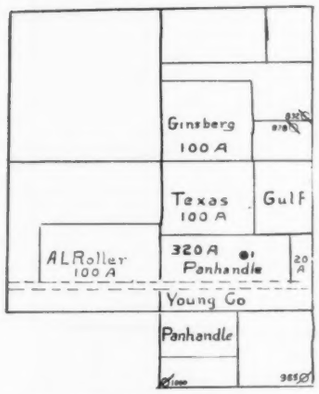
By James H. Dameron

WICHITA FALLS, Tex., Jan. 16.—North Central Texas is opening the year with four new pools definitely opened. None of the pools looms as a market breaker, but each will contribute to holding production in the districts in which they are located. Two pools have been opened in the Wichita Falls district, one in Coleman County and another in Brown County.

Panhandle Oil & Refining Co.'s No. 1 Garvey, Section 1,856 T. E. & L. Survey in southeast Archer County and near the Young County line, was in reality the first wildcat to open a new pool in 1928. The others, while opening new pools, were in the sand at the close of the old year, but were not completed until after the holidays.

No. 1 Garvey had oil sand at 764-72 and 772-76 feet. The producing formation was sandy lime and the pay is 80 per cent lime. The well made 80 bbls. of 39 gravity oil the first 24 hours when put on the pump and 75 the second 24 hours. The next three gauges, however, showed improvement when the well gauged 94 bbls., 90 bbls. and 100 bbls., respectively. The last gauge reported was 62 bbls. in 21 hours. The well was shut down three hours for engine repairs.

No. 1 Garvey is owned jointly by the Panhandle company and A. W. Johnson with the former company in charge of operations. It is flanked on the north and south by four dry holes, all of which went



Southeast Archer County wildcat.

below the producing horizon in No. 1 Garvey. The result of opening the new pool has revived interest in that section of the county and stimulated interest in the offset acreage.

The Panhandle company not only had the distinction of opening the first pool in North Central Texas in 1928, but it held the distinction of having drilled the biggest flush producer on its sensational McCluskey lease, in Young County.

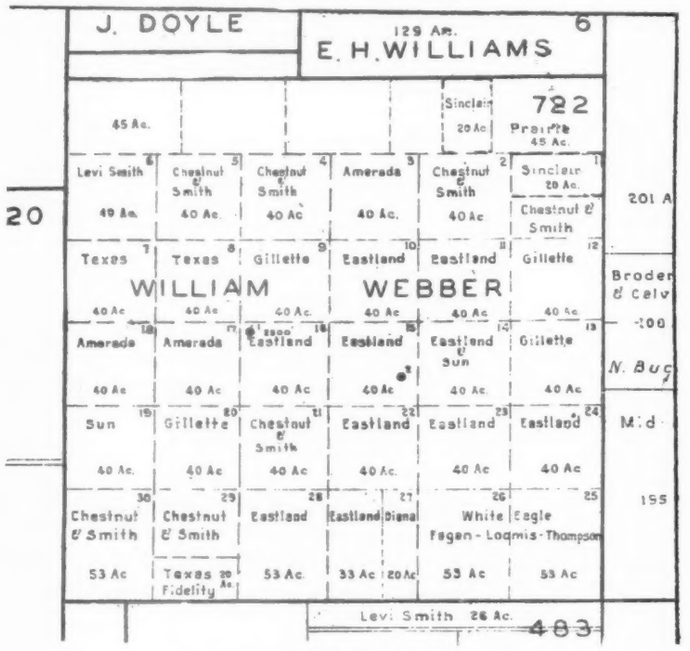
Southwest Wilbarger

Next in line of the pool openers in Wichita Falls district was The Texas Company and Staley & Wynne Co.'s No. 1 W. T. Waggoner, Section 9, Block 5, H. & T. C. Survey, which was completed pumping 25 bbls. of oil and 15 bbls. of water from oil sand at 2,428-29 feet, steel line measurement. The well is in southeast Wilbarger County.

Considerable activity has been reported from that section of the county for several weeks where a wildcat campaign of considerable proportions was under progress. In the Rock Crossing area in Block 4 The Texas Company got a couple of good wells in the 2,400-foot pay and caused a drilling campaign to follow.

Although the operators in that district have been encouraged and have a more optimistic outlook for the coming year, the real topic of speculation in the district is Continental Oil Co.'s No. 60 Gose, the deepest test in the Wichita Falls district. No. 60 Gose is in the heart of the old and famous Texhoma-Gose Pool and is located in the C of the NW of Section 8, A. T. N. C. L. Survey, Archer County.

It is reported to be below 5,100 feet and standing with a hole better than half full of oil. However, the Continental company has succeeded extraordinarily in bottling up information concerning the well and no authentic information as to the status of the well has been forthcoming.



New pool in Coleman County.

To old-timers in the district that is a remarkable accomplishment, especially to many of the operators who attempted to drill a "mystery" test. To scouts the well is a nightmare. They are not permitted in the rig and since the crew has changed over from rotary to cable tools it has been extremely difficult to guess the depth within hundreds of feet. As a result reports are current that give the well depth anywhere from 4,500 feet to 6,000 feet. The 5,100-foot depth seems to be the guess of the majority and the reported best guessers.

More than a week ago the well was reported to be showing oil and following that news was spread that independent operators in the district, financially able, spent $100,000 in fee lands and leases surrounding the well. But with the hole reported to be standing more than half full of oil interest in the well more than "perked" up.

Coleman County Producer

On farther south and in the Ranger district another new pool has been opened in Coleman County by the Eastland Oil Co. and associates. The character of the country around the well gives little surface geology, but a 2,500-foot dry hole which had an encouraging showing led the operators to drill the second test.

Associated with the Eastland company in the area are Chestnut & Smith, Kerr and Gillette and No. 1 Morris was drilled in the NW cor. Section 16, Block 722, William Webber Survey, Coleman County. No. 2 Morris, the discovery well, was drilled in Section 15, about half a mile to the southeast. It was completed making 320 bbls. from sand at 2,100-04 feet. Production is believed to be coming from the Fry sand.

All of the acreage was closely held and when the well started showing as a producer there was little trading in leases. Eastland company and associates are interested in 16 of the 40-acre sections in the block and in four of the 53-acre sections. Leases over to the east and south are also closely held. The pool discoverers have started offsets to the east, south and southeast.

Considerable activity is expected to start in that area of the county in the near future and one test is reported to be rigging up to spud about three-quarters of a mile to the northeast on a lease held by Harry Gwinnup, Coleman, which is about 8 miles to the southwest of the new pool, is experiencing a small boom.

Brown County Development

In Brown County, Pandem Oil Co.'s No. 1 A. L. Curry, north of Thrifty, and about 1½ miles southeast of the Smith-Ellis Pool, is reported as a 500-bbl. well and is regarded as one of the most important developments of that area in months.

The area was discovered more than a month ago by Pandem Oil Co.'s No. 1 Hutton, which is now a 60-bbl. pumper, and No. 1 Curry is an offet. No. 1 Curry is producing from 11 feet of sand topped at 1,110 feet.

The Smith-Ellis Pool started off briskly as a rich small pool, but production soon dropped. When the discovery well was drilled operators were more or less skeptical as to whether the Thrifty area pool would develop into a pool as good as the Smith-Ellis Pool. But with the completion of the 500-bbl. well those operators have a more optimistic outlook, although several of the Smith-Ellis Pool wells were 500-bbl. initial producers.

STORAGE IN WEST TEXAS JANUARY 1; RECEIPTS BY PIPE LINE COMPANIES

SAN ANGELO, Tex., Jan. 16.—Storage in West Texas totaled 14,622,000 bbls. on January 1 and receipts by pipe line companies from the various producing counties in December totaled 7,863,687 bbls. Landreth Production Co. held the most crude in storage of any West Texas producer with a total of 2,307,000 bbls. Simms Oil Co. and Atlantic Producing Co. ranked second with 2,000,000 bbls. of stock.

Southern Pipe Line Co. was by far the busiest pipe line company moving crude by tank cars with a total of more than 1,000,000 bbls. shipped out of the field in tank cars during December. The total amount of crude moved by tank cars during the closing month of the year was 1,259,000 bbls.

Pecos County curtailment program in restricting crude to the amount demanded by the market, thereby avoiding flooding the market and saving operators a huge sum in tanks and carrying charges, is easily accomplishing its purpose. Only 280,000 bbls. of crude was stored in Pecos. Aside from the 600,000 bbls. of Yates Pool crude held by the Illinois Pipe Line Co. in Val Verde County, there was little of Yates Pool crude stored in other West Texas Counties.

Storage by Counties

Storage by counties in West Texas during the month of December is shown as follows:

	Bbls.
Crane County	6,362,258
Crockett County	28,854
Jones County	4,675
Midland County	1,590,635
Mitchell County	416,243
Pecos County	280,215
Reagan County	1,587,741
Upton County	1,878,457
Ward County	598,719
Winkler County	1,245,738
Val Verde County	629,388
	14,622,923

Storage by Companies

Storage by companies in West Texas during the month of December is shown as follows:

	Bbls.
American Petroleum Co.	371,328
Atlantic Oil Producing Co.	573,387
Bartex Pipe Line Co.	4,675
Big Lake Oil Co.	604,962
Church & Weekley	131,700
Eastland Oil Co.	950,000
Gulf Pipe Line Co.	702,071
Gulf Prod. Co.	185,032
Humble Oil & Refining Co.	133,656
Humble Pipe Line Co.	1,318,727
Illinois Pipe Line Co.	908,054
Independent Oil & Gas Co.	159,600
Kay County Gas Co.	710,990
Landreth Production Co.	2,307,510
Magnolia Petroleum Co.	71,175
Magnolia Pipe Line Co.	1,126,422
Pecos County	1,538,433
Prairie Oil & Gas Co.	508,896
Reagan County Pur. Co.	340,031
Roxana Petroleum Co.	208,044
Simms-Atlantic Oil Prod. Co.	2,021,174
Simms Oil Co.	10,586
Southern Pipe Line Co.	541,171
Texas-Pacific Oil & Coal Co.	59,231
Texas Pipe Line Co.	35,434
The Texas Company	36,480
Texon O. & L. Co.	75,848
Turman et al	4,562
	14,622,923

Pipe Line Receipts

Pipe line receipts from the various West Texas producing counties during the month of December is shown as follows:

	Bbls.
Crane County	2,960,932
Crockett County	86,355
Howard County	202,321
Jones County	39,675
Mitchell County	104,950
Pecos County	1,538,433
Reagan County	681,623
Runnell County	2,600

(Continued on Page 147)

Wants Salt Water, So Drills for It

Well Being Drilled to Depth of 3,000 Feet, With Showings of Oil and Gas Cased Off, to Get What Oil Men Loathe

By Thomas F. Smiley

Salt water, despised and rejected of oil men, is just the thing the Martin Process Co. wants. It sets such store by salt water that it is drilling a well to get it. When the company gets this one finished it will drill three more. Its method in certain particulars is precisely the opposite of that employed by the oil operator. Where the oil operator cases off water encountered in the hole and bends his energies to the production of oil, the Martin Process Co. cases off oil and gas as pestilential, but welcomes salt water.

Why does the company want salt water? Because there is salt in it. Or, rather, there are salts in it.

To get these salts out of the water the

Left—W. H. Colvin, Jr., president of the Martin Process Co., and in charge of business details. Right—Dr. Otto V. Martin, technical director, who developed the processes of recovering valuable chemical products from salt water.

Martin Process Co. is operating a quarter-of-a-million-dollar plant and has under way a million-dollar expansion program, at the completion of which its 15 acres of ground at Sand Springs, near Tulsa, Okla., will be dotted with buildings of various kinds.

There are now eight 50-by-100-foot buildings and there will be about 20 more of this standard size. One new building, 50 by 400 feet, is nearing completion. More strictly, the structure consists of four adjoining buildings, each 50 by 100 feet. In these buildings are performed important parts of the processes inolved in recovering sodium chloride (common table salt), the leading one of the company's products in point of bulk, but perhaps the least important in most other respects.

Two years ago this plant was started on a small scale, as described in The Oil and Gas Journal at the time. The commercial production was inconsequential. At the present time the capacity operation is approximately 100 tons of chemicals a day. The additional buildings and equipment will increase this output several times.

The Sand Springs Chemical Co. was organized in 1925 by Dr. Otto V. Martin, consulting chemist, and the late Charles Page, oil man and founder of the Sand Springs Home, to develop the Martin processes of evaporation. In April, 1926, the company began operating on a small commercial scale. In December, 1926, Mr. Page died, shortly after completion of plans for enlarging the plant. In the fall of 1927 W. H. Colvin and W. H. Colvin, Jr., then of Colvin & Co., industrial bankers of Chicago, and Doctor Martin formed the Martin Process Co., which took over the original Sand Springs Chemical Co. About $250,000 had been invested in the salt-water project at this time.

Expansion Program Resumed.

The reorganized company resumed the expansion program which had been interrupted by Mr. Page's death. W. H. Colvin, Jr., president, now is giving his entire time to business details of the company and the technical staff, with Doctor Martin as director, has been enlarged by the addition of three chemical engineers, H. D. Grant, formerly with the Swenson Evaporator Co., Chicago; F. B. Sherwood, formerly with the Mid-Continent Petroleum Corp., Tulsa, and Earl Martin, formerly with the American Aluminum Co., Bauxite, Ark. Further additions to the technical staff are to be made, it is understood.

Chemical products directly obtainable from the salt water encountered in the production of petroleum are sodium chloride, familiar through its use in the kitchen, on the dining-table and in technical fields as ordinary salt; calcium chloride, used in hastening the setting of cement, in refrigeration and (in solution) in laying dust on roads; magnesium compounds; bromine, a common constituent of ethyl gas, and iodine, found in every medicine closet.

The magnesium compounds include magnesium sulphate (epsom salts), magnesium hydroxide (milk of magnesia), magnesium chloride and magnesium oxide. The last-named two compounds have wide commercial use. A combination of magnesium chloride and magnesium oxide produces plastic magnesia cement, or magnesia stucco, used in mural decorations, art windows, etc.

This plastic magnesia cement, called by chemists oxychloride cement, played an important part in the World War, when often it was necessary to cast foundations for big guns one day and use them the next. It is said on good authority that "Big Bertha," the German gun with which Paris was shelled, stood on a base of magnesia cement.

It is planned by the Martin Process Co. to establish in the immediate future four, and possibly five, similar plants in other parts of the country. The location of these will depend upon their commercially strategic position and upon the character and quantity of salt water obtainable. Sodium chloride and calcium chloride will be made in all these plants, not only because of the broad demand for these products, but because they are easily derived in the first steps of the evaporaiton procedure. Besides the group of compounds directly obtainable from the salt water, some 60 other products may be made, but it will be left for the future to determine just which of these the different plants will manufacture. Economic considerations will prevail here of course. As the matter of making any particular product is chiefly one of chemical formula and not of mechanical equipment, it will be a comparatively simple thing for any one of the plants to shift from one product to another as industrial or other demands may make advisable.

Many Products Possible

As an instance of what may be done if it proves commercially advisable, it might be pointed out that hydrochloric acid can be made from the sodium chloride. As a byproduct in this operation salt cake would be left. The salt cake is used in the manufacture of glass.

By application of electricity or of other chemicals an amazing number of commercial products may be made from oil-well brine. It is declared there are enough nitrates in Oklahoma's oil-well salt water to fertilize the whole state. The presence of nitrates was discovered by accident when workmen employed in connection with the Martin processes were driven from a building by ammonia fumes. Other products are chloroform, any of the alcohols, caustic soda, chlorine and carbon-tetra-chloride.

All the products recovered by the evaporation process are said to be unusually pure. Tests are said to show the salt to be 99.9 per cent pure and to be free of calcium sulphate or gypsum. This is of special importance in the use of salt in zeolite water-softening plants. The demand for salt for this purpose alone is said to exceed the production at the present time. All the products in crystal form are light and fluffy and as a result they are easily soluble.

At the plant in Sand Springs the salt water thus far used has come from nearby oil wells, whose owners are delighted to have somebody dispose of it for them. The water is collected by gathering lines and piped to the plant, where as the first step in its utilization it is run into a treating tank. Here lime is added to the raw brine. The liquid then flows from the bottom of the tank to a settling pond. Here the sludge formed as a result of the previous treating settles to the bottom. This sludge is composed chiefly of magnesium hydroxide, iron hydroxide, excess lime carried from the treating tank and other impurities, such as fine sand.

The brine from the settling pond then passes to a reservoir, 60 by 260 feet, of concrete, with V-shaped sides. This reservoir is equipped with a series of nozzles through which the brine is sprayed continuously, and on account of this the reservoir is referred to as the spray pond. New reservoirs will have 16 times the capacity of the present one.

At the bottom of the spray pond the sloping sides, instead of meeting in the acute angle of a V, are fashioned into a rectangular trough, through which a drag-chain moves constantly.

The Spray Pond Cycle

Evaporation of the brine, previously stated, is effected as it is shot into the cooler air in the form of fine vapor through the myriad of nozzles, and as fast as this evaporation proceeds salt crystals settle in the trough at the bottom of the pond. The course of the brine in the spray pond is through an outlet pipe to turbine condensers, which heat it and from which it goes to the spray nozzles and thence back into the pond, to be carried through the condensers and the rest of the route over and over until almost complete crystallization of the salt has been accomplished.

The drag-chain running through the trough at the bottom of the spray pond carries the wet crystals to the first of the four salt process buildings, the washer building, of concrete and tile. Pumps convey the wet salt into separating tanks, from which the mother liquor, or bittern, accumulating at the top as the salt settles at the bottom, is carried back to the spray pond for further processing. The salt drops from the bottom of the separating tanks to the washer proper, consisting of motor-driven racks which agitate the salt in saturated salt brine and carry it to centerfuges, or wringers, which throw out most of the water.

From the centrifuges the salt, still damp, drops onto a belt conveyor and is carried into the adjoining bulk storage building, of special frame construction on concrete piers. Here scraping devices remove the salt from the belt to the floor, where it now is dry enough to ship for most industrial and technical uses. The salt at this stage is suitable for packing-house use.

The treating tank, where the first step in the processing of oil-well brine takes place.

Such of the salt as is to undergo fur-

(Continued on Page 173)

Many Gasoline Sellers in Oklahoma

Over 500 Companies and Individuals Marketing in State. The Leading Companies Have 60 Per Cent of Total

By C. O. Willson

An article discussing marketing conditions in Oklahoma and Tulsa Counties of Oklahoma will be found on page 148 of this issue.

Oklahoma in addition to being the center of activities for many crude oil producing and refining organizations can also lay claim to be the home of an exceptionally large number of gasoline and lubricating oil distributors.

In November based on the collection of state gasoline taxes there were 530 companies or individuals distributing gasoline in the State as wholesalers. The Oklahoma law provides that the tax be paid on a basis of refinery deliveries to those responsible for the bulk distribution within the State, the latter paying the tax.

Oklahoma has always had an exceptionally large number of distributors. According to the state auditor's department which has charge of the gasoline tax collection there has been a gradual decline in the number of companies engaged in the marketing of petroleum products within the State, but the total for November of 530 is still far above the average in other states. The fact there are 41 operating refineries scattered over the State accounts in part for this situation. These refineries endeavor to maintain as large a distribution within the State as possible and encourage companies to build marketing facilities so that they can buy in tank car lots. Many of these refining organizations also have their own distribution facilities within the State.

This situation as to a large number of small distributors is reflected in the fact that of the 530 distributors in the state 280 report sales of less than 10,000 gallons during the month. In other words approximately 50 per cent of the distributors sell only one tank car or less monthly. The actual average sales of these 280 distributors would be less than 200 gallons daily.

Trend in Marketing

Although there are still a relatively large number of distributors the trend in Oklahoma is the same as that in other states in that the distribution is slowly passing into the hands of fewer and larger companies.

The accompanying table gives the gasoline sales in November of the 10 largest distributors in the State. The sales of these 10 companies totaled 12,045,409 gallons or approximately 60 per cent of the total for the State.

The sales of these major distributors in most cases have shown large increases. The November, 1926 sales of the Magnolia Petroleum Co., totaled 2,041,128 gallons; The Texas Company, 1,318,326 gallons; Marland Refining Co., 1,669,358 gallons; Pierce Petroleum Corp., 1,374,061 gallons; Barnsdall Refining Co., 778,584 gallons; Champlin Refining Co., 417,919 gallons; Cities Service Oil Co., 606,348 gallons, and Continental Oil Co., 477,077 gallons.

Without exception these large distributors either directly or through subsidiary or allied companies have one or more refineries conveniently located for distribution within the State. Of the first 10 all have refineries within the State except the Magnolia Petroleum Co., whose closest refineries are located at Dallas and Forth Worth, Texas. The other nine companies have refineries in Oklahoma as follows: Marland Refining Co., Ponca City; The Texas Company, Tulsa; Pierce Petroleum Corp., Sand Springs; Barnsdall Refining Co., through Barnsdall Refineries, Inc., Okmulgee and Barnsdall; Champlin Refining Co., Enid; Cities Service Oil Co., through Empire Oil & Refining Co., Cushing, Ponca City and Okmulgee; Continental Oil Co., Sapulpa; High Test Oil Corp., through Shaffer Oil & Refining Co., Cushing and Transcontinental Oil Co., Boynton and Bristow.

These refineries give the marketing departments the benefit of relatively low intrastate rates and in other ways facilitate the distribution of products within the State. The Magnolia Petroleum Co., which was the original Standard representative in the State has the widest distribution. Its bulk stations practically cover the State.

Standard Competition

It is interesting to note that this company which is a subsidiary of the Standard Oil Co. of New York has important competition from other companies which are classed in the Standard group. The Continental Oil Co. which has its general offices in Denver and which is the largest distributor in the Rocky Mountain states has rapidly expanded its marketing facilities in Oklahoma during the past three or four years. This rapid expansion started when the company acquired the Sapulpa refinery of the Sapulpa Refining Co. Its 1927 distribution was approximately double that of 1926.

The Standard Oil Co. of Indiana which is largest distributor in 11 states of the Middle West is also a large distributor in the northern part of the State. Its November sales totaled 171,965 gallons.

The Marland Refining Co. has had a steady expansion in its Oklahoma marketing over a period of several years. Next to the Magnolia company its distribution in the State is probably wider than any other company. The Texas Company and Pierce Petroleum Corp. also have a wide distribution, the latter being one of the oldest distributors in Oklahoma. The Champlin Refining Co. has expanded its marketing facilities rapidly during the past two years.

In the expansion programs of these large distributors many independent jobbing interests have been taken over. It is probable that the next year or two will see additions to the list of major distributors. The Roxana Petroleum Corp., a large distributor in many of the middle western states recently entered Oklahoma with its own distributing facilities. Its sales for November totaled 282,765 gallons. The Skelly Oil Co. is also a large distributor although its Oklahoma distribution up to this time has been centered in Tulsa County. Among the larger jobbing companies in the State with their November sales are: Rock Island Oil Co., 113,706 gallons; Crescent Oil Co., 161,365 gallons; Eason Oil Co., 297,447 gallons and Klein Oil Co., 135,795 gallons.

Consumption Increases

Distributors in Oklahoma have been favored with large increases in gasoline consumption for the past three years; have been among the largest in United States. The following table shows the consumption for the past three years.

Year	Gasoline Consumption Gallons	Yearly Increase	Tax Collected
1927	248,256,916	33,893,048	$7,224,276.29
1926	214,363,868	37,610,691	6,237,989.09
1925	176,753,177		5,143,517.45

Consumption Uniform

Another favorable factor in the Oklahoma marketing situation is the fact that the gasoline consumption is much more uniform throughout the year than in many of the northern and eastern states. The seasons are favorable for the continuous use of cars, a situation which is aided by improved highways in the main consuming centers.

The following table shows the monthly consumption for the year ending December 1, 1927:

	Gallons
December, 1926	18,319,242
January, 1927	16,455,446
February	15,761,695
March	18,934,059
April	19,146,533
May	21,645,353
June	23,077,695
July	24,435,094
August	23,681,824

OKLAHOMA'S MAJOR GASOLINE SELLERS

The 10 largest distributors in Oklahoma sell approximately 60 per cent of the State's total. Following is the November gallonage of these companies based on reports made to the state auditor's department in connection with the collection of a 3-cent gasoline tax:

Main office—	Gallons
Magnolia Petroleum Co., Oklahoma City	2,546,164
The Texas Company, Oklahoma City	1,823,608
Marland Refining Co., Ponca City	1,816,124
Pierce Petroleum Corp., Tulsa	1,591,412
Barnsdall Refining Co., Tulsa	967,044
Champlin Refining Co., Enid	856,331
Cities Service Oil Co., Tulsa	771,171
Continental Oil Co., Tulsa	745,489
High Test Oil Corp. (Shaffer Refining Co.)	492,955
Transcontinental Oil Co., Tulsa	448,495
Total	12,045,409

Frank Talks Mark Slick Dinner

Mid-Continent Oil Men, Guests of Leading Independent Producer, Express Approval of Co-operative Effort

By Thomas F. Smiley

The extent to which candor and co-operation have taken the place of doubt and distrust among Mid-Continent oil operators and the earnestness of their determination to make 1928 a greater year in point of unity than 1927 were emphasized afresh at the Tulsa Country Club, Tulsa, Tuesday night of this week when more than 200 oil men from Texas, Oklahoma, Kansas and New York met around the banquet table, talked frankly with each other, exchanged experiences and listened to talks in which their common problems were discussed freely and informally.

Thomas B. Slick, of Tulsa,—"Tom" to virtually all who grasped his hand in greeting—was host. Mr. Slick, who is head of the Thomas B. Slick interests, is credited with being the largest individual operator in the country. That unanimity offered the resolvent for some of the oil industry's most serious troubles has been a conviction of Mr. Slick and the dinner arranged by him was designed expressly to foster the spirit of concord which has made such headway since the Seminole agreement was entered into five months ago, accompanied at first by manifestations of incredulity and suspicion.

Although the dinner was conceived and details arranged long before the Federal Oil Conservation Board made its second report to the President under date of January, 1928, its purpose and implications gain special significance as a result of a warning issued by Hubert Work, chairman of the board, in presenting the report. He says: "Following the completion of its third report this board will, if in the meantime practical conservation measures have not been adopted by both Government and industry, make certain specific recommendations to the President of the United States, designed to further safeguard the country's natural petroleum resources."

Benefit of Harmony

Speakers indicated a belief that even overshadowing in importance the discovery of oil in the Seminole Field was another discovery made there—the discovery that once given an opportunity really to know each other, men engaged in ruthless, wasteful competition could be brought to abandon purely selfish considerations for the common good. The spirit of fellowship gave clear evidence that the men present, representing the important oil producing interests in the Mid-Continent, had no intention of allowing any lack of harmony hereafter to give the Federal Oil Conservation Board reason for recommending action looking to removal of the oil industry's control from the hands of the industry itself.

Messages of regret to Mr. Slick from men high in the councils of petroleum who were unable to be present but who desired to express their warm approval of the purpose of the dinner were read.

E. W. Clark, president of the American Petroleum Institute, wired from Los Angeles, Cal.: "I regret it will be impossible for me to be with you on the evening of January 17. I favor all such get-together meetings and only wish it were possible for me to be present. Kindest regards and every good wish for your success."

Edward T. Moore, Dallas, Tex., president of the Simms Oil Co., telegraphed: "I greatly regret that other engagements prevent my attending your dinner. I am heartily in accord with the thoughts expressed in your letter and believe a gathering of producers such as you propose should result in great good to the industry. My own thought is that when the leaders of the industry come to the point where they will discuss their problems frankly with each other the business will soon get on the proper basis. My best wishes."

The Marland companies were represented, but C. C. Brown, vice-president,

(Continued on Page 149)

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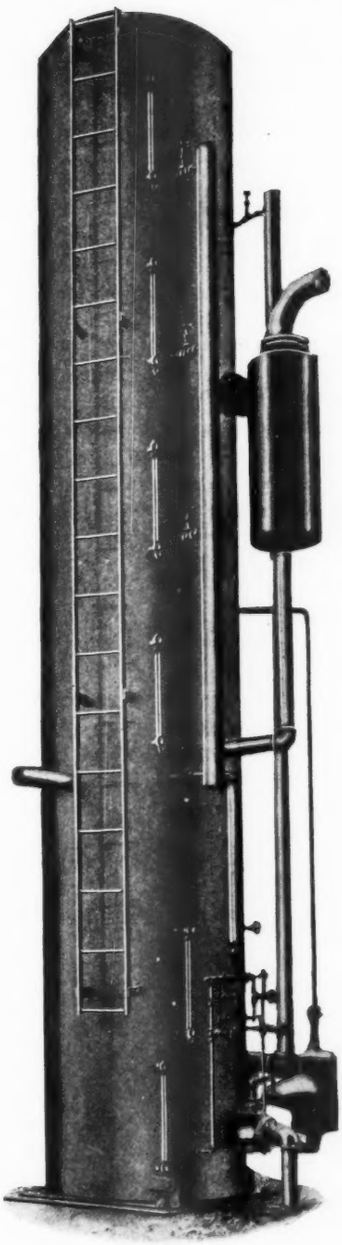

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That growth in demand, year after year, is the big factor, not the temporary fact that in one year we had phenomenal production of our raw material.

Having a six months' supply of oil on hand may be costly and burdensome but it will not have to be sold at a loss. Any material withdrawal from stocks would inevitably force readjustment in crude prices. That is the record of experience.

Our existence as an industry depends upon a supply of crude which is uncertain and irreplaceable. Other industries suffer at times from shrinking demand but the oil industry has none of that. Its real trouble would be a shrinkage in the supply of its raw material.

The oil industry is fundamentally sound. Other industries have a more or less limited volume of consumption but oil has the whole world waiting just outside the door. We had overproduction from eight fields in 1923 but in 1926 we were withdrawing from stocks.

Last year we had a record in overproduction. This year, unless all signs fail, we are going to have a record in consumption. The automotive industry, our chief customer, is going to turn out 5,000,000 cars, the greatest number ever produced.

Edsel Ford is quoted as reporting orders for 700,000 cars, or about as many as last year's motor output declined. Lower prices and exceptional competition must have a corresponding effect throughout the industry. The extraordinarily popular interest shown in the new cars will be reflected in sales and of course in the consumption of gasoline.

Continuing and generally diffused prosperity, coupled with financing plans which permit the easiest possible purchase of a car will broaden the market. Those who have never had a car can hardly longer resist and those who have one for a family will want an individual car. The prices and the value of the products will be the most tempting in years.

There has been much talk about improved engines and greater mileage per gallon but motorists have been more interested in quick starting and more satisfactory operation than in gains in mileage. The records show that the gallonage per car is increasing each year through greater use. With the increase in number of individual cars that trend may be expected to continue because cars will be more readily available when desired.

Theoretically it is possible that better engines could reduce the consumption per car but that is yet in the future. In the meantime the rest of the world will be becoming motorized.

The progress of the industry since the war has been a world revelation. At the recent World Motor Transport Congress in London delegates from the United States, Great Britain, Australia, France, Italy, Germany, Egypt, Palestine, Japan and China traced much of the economic improvement in their respective countries during the past ten years as largely attributable to the development of highway motor transport. British Empire representatives emphasized the potentialities for motor transport in such great areas as India, Australia and South Africa.

But the market for motor fuel is not all, nor the widening need for lubricating oil. The co-operation begun between the American Petroleum Institute and the oil burner manufacturers should result in an immense stimulus to the use of oil for domestic heating and the full development of the potential market for distillates.

The oil burner has made wonderful strides in use despite the early handicaps of popular doubt about assured fuel supply at reasonable cost and difficulties over the grade of fuel required.

If the oil industry will come forward with assurance of supply and quality for oil burners as it did in furnishing fuel for motor cars it will not take long for the public to take to oil heating. Energetic co-operation between the burner manufacturers and the oil industry should be able to develop a comparatively cheap but efficient oil heater that would popularize oil heating as the cheap motor car did motoring. When that is accomplished, as it will be sooner or later, petroleum's bulk product will come into its own.

Considerations like these reduce the bogey of overproduction to its proper dimensions. The crude situation is in process of adjustment. The producers have shown themselves capable of self-regulation. It remains for the manufacturing and marketing divisions to prove an equal capacity for handling their branches.

Forty, or perhaps fifty million barrels more of gasoline may be consumed this year than last but if every producer or marketer starts out with the idea of getting the lion's share of that additional sale, and increases his runs or his filling stations with that notion, everybody in the industry ought to know by this time what the result will be.

The price structure of the whole industry can be ruined more quickly that way than any other. The refiners as a whole have been moderating their operations. The weakest spot in the industry is the marketing end where multiplication and duplication of outlets have long passed all reason.

The expected record demand this year may indeed constitute a real danger because of the invitation to overmanufacture or to enlarge the number of outlets. A survey of distribution undertaken by the American Petroleum Institute, following the remarks of the Federal Trade Commission in its report on that subject, might aid in averting the danger.

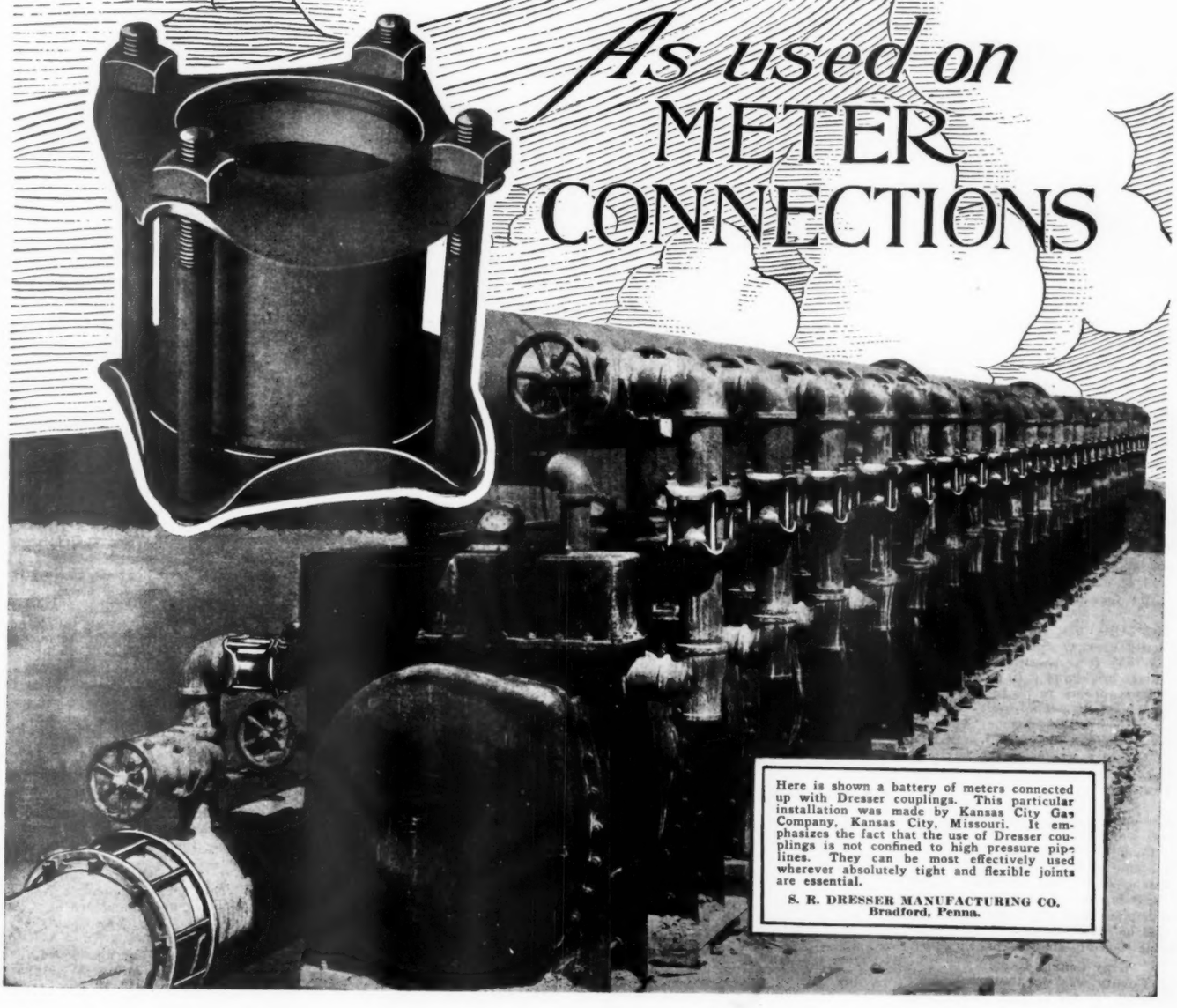
But the best assurance will be for each individual to base his business on profits and not on mere gallonage.

Ten years ago the average business man would have been ashamed to say he owned oil stock or gas stock. A bond issue on oil holdings was unthinkable among financiers. Now they are scrambling for them. The other day there was a collapse in the New York stock market—except in the oil issues, which as a whole moved up.

That is the practical view of the oil industry's position, of its unique possession of an almost limitless market for its products which makes even a year of unprecedented overproduction merely an incident in its progress.

DRESSER COUPLINGS Dominate!

As used on METER CONNECTIONS



Here is shown a battery of meters connected up with Dresser couplings. This particular installation was made by Kansas City Gas Company, Kansas City, Missouri. It emphasizes the fact that the use of Dresser couplings is not confined to high pressure pipe lines. They can be most effectively used wherever absolutely tight and flexible joints are essential.

S. R. DRESSER MANUFACTURING CO.
Bradford, Penna.

Pool Openers in North Central Texas

Wichita Falls and Brown County Areas Featured.
Gray County Monopolizes Panhandle Developments

By James H. Dameron
Staff Correspondent, Texas Panhandle Fields

FORT WORTH, Tex., Jan. 16.—Completion of two pool openers in the Wichita Falls district and completion of a well that indicates the discovery of another good Brown County pool featured the field developments in North Central Texas, while Gray County spoke for the Panhandle during the week closed.

Production in Panhandle and the Wichita Falls district declined 1,945 bbls. and 2,815 bbls., respectively, in daily average. The Ranger district, however, showed an increase of 838 bbls. in daily average. Two new pools in the Ranger district are expected to hold production there and new areas in the Wichita Falls district are expected to keep production there on an even keel.

In Wichita Falls two wells opening pools were completed. The Texas Company and Staley and Wynne Co.'s No. 1 W. T. Waggoner, Section 9, H. & T. C. Survey, Wilbarger County, was completed in sand at 2,428-29 feet, making 25 bbls. of oil and 15 bbls. of water. That well opened a new pool in that section and has started small play in that area.

Panhandle Oil & Refining Co.'s No. 1 Garvey, Section 1,856, made 80 bbls. the first 24 hours from oil sand at 764-72 feet, 75 bbls. the next, 94 the next, 90 the following and 100 bbls. the following 24-hour period.

With those two completions opening the new pools and the extension of other areas and in particular production in the Rock Crossing area, Wichita Falls operators closed a busy week.

Archer County Feature

Continental Oil Co.'s No. 60 Gose in the old Texhoma Gose Field of Archer County is causing excitement. Operations of the well have been kept secret, but direct rumors in Wichita Falls have it that the well is standing more than half full of oil from below 5,100 feet. Geologists who base their opinion upon the rumor the well is below 5,100 feet believe production, if any, is coming from the Marble Falls lime of the lower Pennsylvanian, Bend series. However, all reports concerning the well are speculative.

Gulf company's No. 5 Lisle, Margaret Hall Survey, in the old Bunger Field in Young County, may lead to deeper development in that area. The well is averaging around 36 bbls. of 36 gravity crude from 3,856 to 3,935 feet. The formation has been blue shale, gray lime and black slate and at present the well is in gray lime. The formation will probably be shot.

Pandem Oil Co.'s No. 1-B Curry in the Thrifty area was completed in sand at 1,114-25½ feet making 585 bbls. of 43.1 gravity crude and definitely opening a pool that appears to be good for several 500-bbl. wells. The well offsets a 60-bbl. pumper drilled in about a month ago. As a result of the 500-bbl. well new interest has been created in the territory and an active play is expected to follow. The new pool is near the Smith-Ellis Pool.

Roeser and Pendleton and Marland Oil Co. have started drilling in several wells in the Cook Ranch Pool of Shackelford County. One well was completed during the current week. Ten are being rigged up to drill in, four are drilling and four others that are shut down on top of the sand will be drilled in as soon as the 10 now being rigged to drill in are completed.

Gray County Leads

Gray County was the Panhandle during the week, so far as field news, first reports and completions went. A dual situation exists in Gray with operators reluctant to develop their property rapidly and pipe line companies in need of oil to keep the lines moving at capacity. Production took another drop in that county during the past week.

Summarized, there are 195 field operations in the Panhandle, including the Panhandle of Oklahoma. Of those operations 83 are drilling wells and 67 are shut down. The remainder is divided among derricks, rigs, old locations and new locations.

Locations took a leap in Panhandle when 14 new locations were reported from that area. Eleven were in Gray County, 1 in Hutchinson and 2 in Wheeler County. In Gray the locations were divided between the McCauley area in eastern Gray, several scattered on the western side and the remainder in the Bowers Pool.

Two good wells were completed in that pool during the week, one by the Gulf Production Co. and the other by The Texas Company. No. 1 J B. Bowers, SW cor. E half Section 89, Block B-2, flowed 950 bbls the first 24 hours and 1,246 bbls. the second 24 hours from granite wash at 2,845-52 feet and 2,858-61 feet. The well had 40,000,000 feet of gas at 2,810 feet which gradually increased to that output from 2,445 feet. The gas was cased off.

Gulf Production Co.'s No. 3-A Bowers, SE cor. W half Section 89, had soft granite wash at 2,900-18 feet and made 850 bbls. of 42.3 gravity oil the first six hours. It is now producing at the rate of 140 bbls. per hour. For the 24-hour period ending January 16 the well produced 3,160 bbls.

Midwest Exploration Co.'s No. 1 Bowers in the NW cor. N half SW Section 63, Block B-2, which made 810 bbls. the first 24 hours from 3,054-64 feet, is down to 240 bbls. daily and may be drilled deeper. Other wells that are in some stage of completion do not appear so attractive.

One interesting test to be drilled in the Bowers Pool will be Danciger Oil & Refining Co.'s No. 1 Bradford, NE SE Section 123, Block B-3. The test is about 1½ miles to the east and material is being moved in for a derrick.

Bowers Pool Production

Production in the Bowers Pool was better than 8,100 bbls. during the week closed. The following is production by companies:

Company—	Wells	Prod.
Danciger et al	4	5,241
Delaney et al	2	Off
Gibson Oil Corp.	1	910
Champlin and Parks	1	10
Gulf Prod. Co.	1	692
Majestic Oil Co.	3	108
Midwest Co.	1	274
Operators Oil Co.	1	409
Phillips Pet. Co.	3	291
Pollard et al	1	63
The Texas Company	1	136
Total	19	8,134

In Wheeler County, Piney Oil & Gas Co.'s No. 1 W. S. Walker, Section 44, Block 24, H. & G. N. Survey, is flowing about 18 bbls. daily from granite wash at 2,443-45 feet and is drilling ahead. The well may extend the old Smackover Field to the northwest.

In Hutchinson County, Skelly Oil Co.'s No. 2 Armstrong and Byrd was not helped by drilling deeper or shooting. The well had 800 feet of oil in the hole at 3,146 feet and was drilled to 3,180 feet without an increase. The formation at 3,125-60 feet was shot with 60 quarts and the hole bridged.

A completion in Carson County almost wiped out that county's field operations At present one well is being worked over in that county and two others are shut down. Wheeler, Gray and Hutchinson are the most active counties. However, the sharp increase in first reports is taken in some quarters as indicative of the Panhandle operators' intentions of speeding up drilling.

WILDCAT OPERATIONS IN PANHANDLE

Week Ending January 14, 1928

Company, Well, Farm, Name, Section and Block—	Remarks—
ARMSTRONG COUNTY	
United Oil & Trust Co.'s No. 1 J. P. Reck, Sec. 162, Blk. 4, H. & G. N. Sur.	Fish. for bit, 2,260 ft.
BAILEY COUNTY	
Gibson Oil Co. et al's No. 1 Webb Miller, NE cor. Sec. 15, League 186, Swisher County school land	Rig.
Humble O. & R. Co.'s No. 1 W. H. Fuqua, C E ½, Sec. 117, Blk. A, Melvin, Blum & Blum Sur.	Drlg., 2,762 ft.
BRISCOE COUNTY	
C. S. Rice's No. 1 J. C. Anderson, SE cor. NW NW, Sec. 22, Blk. B-3, B. S. & F. Sur.	S.D., 1,620 ft.
CARSON COUNTY	
Amatex Dev. Co.'s No. 1 E. S. Polling, Sec. 22, Blk. 2-Y	T.A., 2,110 ft.
Marston Oil Co.'s No. 1 J. L. Noel	S.D., 3,064 ft.
Navajo Oil Co.'s No. 1 E. S. Polling, Sec. 22, Blk. 2-Y	Set. 6-in., 2,496 ft; S.D., 2,712 ft.
The Texas Company's No. 2 C. R. Garner	25,000,000 ft. gas, 2,300-25 ft; rig burned; rebuild. rig.
Willis et al's No. 1 Burnett est., C SE SW NW, Sec. 111, Blk. 5	T.D., 3,050 ft; C.O.; show oil, 3,-010 ft; show wtr., 3,040 ft; lime; pull. 6-in., 3,192 ft.
CASTRO COUNTY	
Colorado O. & R. Co.'s No. 1 M. Slemmons, SW cor. Sec. 73, Blk. M-17, B. S. & F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE, Sec. 333, Blk. M-6, S. K. & K. Sur.	S.D., 510 ft. for casing.
CHILDRESS COUNTY	
Hoover & Calloway's No. 1 O. L. Tucker, Sec. 736, Haggard Sur.	Spudded and S.D.
C. L. Sloane et al's No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	Set 6-in., 2,902 ft; S.D., 3,650 ft.
COTTLE COUNTY	
Exploration Co.'s No. 1 Richards	Spudded and S.D.
DALLAM COUNTY	
Wood Bros. et al's No. 1 Capitol Synd., Sec. 19, Blk. 17	Hole full wtr., 4,007-4,127 ft; T.D., 4,188 ft; S.D. until spring.
Marland Oil Co.'s No. 1 A. M. James, C SW W ½, Sec. 21, S. H. McElreath Sur.	U.R. 8-in., 2,750 ft.
Marland Oil Co. et al's No. 1 Capitol Synd., Sec. 36, Blk. 18, Capitol Synd. land	S.D., 4,196 ft.
DONLEY COUNTY	
A. T. Drlg. Co.'s No. 1 F. E. Harrington, Sec. 29, Blk. 3-C	1,200 ft. wtr., 3,115-22 ft; show gas, 3,140-60 ft; dry G.W., 3,-260-93 ft; S.D., 3,495 ft.
FLOYD COUNTY	
Explin. Co.'s No. 1 S. H. Boone, C. C. H. Johnson Sur.	Spudded and S.D.
Explin. Co.'s No. 1 Land & Cattle Co.	S.D., 780 ft. for orders.
Hoffer Oil Corp.'s No. 1 Nelson	Spudded and S.D.
GRAY COUNTY	
Archer Blake's No. 1 Turneaux, SW cor. Sec. 111, Blk. B-2	S.D., 255 ft.
Bay Shore Oil Co.'s No. 1 C. W. Bradford, Sec. 143, Blk. 2-B	T.D., 2,666 ft; S.L.M. shot with 10 qts. to loosen bit and 8-in collapsed; drlg. up 8¼-in.
Biggs et al's No. 1 Morse, SW cor. Sec. 3, Blk. 26, H. & G. N. Sur.	Location.
Camel Oil Co.'s No. 1 B. E. McKinney	Rig.
Cole O. & G. Co.'s (was Magdalene Oil Co.'s) No. 1 J. E. Williams, Sec. 17, Blk. 1	S.D., 3,860 ft.
Danciger O. & R. Co.'s No. 5 W. Jackson	Set. 8¼-in. csg., 2,730 ft.
Danciger O. & R. Co.'s No. 6 W. Jackson, Sec. 88, Blk. B-2, H. & G. N. Sur.	Drlg., 2,600 ft.
Danciger O. & R. Co.'s No. 7 W. Jackson, Sec. 88, Blk. B-2, H. & G. N. Sur.	Drlg. sandy lime, 2,632 ft.
Danciger O. & R. Co.'s No. 8 W. Jackson, NE cor. NW, Sec. 88, Blk. B-2	Drlg., 2,199 ft.
Danciger O. & R. Co.'s No. 1 W. Crank, SW cor. NW, Sec. 163, Blk. 3, I. & G. N. Sur.	Location.
Danciger O. & R. Co.'s No. 1 A. Chapman, SW cor. NW, Sec. 7, Blk. 26, H. & G. N. Sur.	Location.
Danciger O. & R. Co.'s No. 1 C. W. Bradford, NE cor. SE, Sec. 123, Blk. B-2, H. & G. N. Sur.	Location.
Donley Gray Oil Co.'s No. 1 J. W. Gordon, Sec. 79, Blk. 3	Wtr. 3,380 ft. and 3,420 ft; show oil; H.F.W., 3,650 ft; drlg., 3,-860 ft.
Delaney et al's No. 2 Jackson	3,000,000 ft. gas, 2,590 ft., increased to 11,000,000 ft. at 2,760 ft. drlg., 2,994 ft; show oil, 2,-850-77 ft; T.D., 3,054 ft; P.B. to 3,025 ft; had 1,500 ft. salt wtr., 3,053-54 ft; shot with 120 qts., 2,977-3,025 ft; swabbed 75 bbls. in 24 hrs.
Delaney et al's No. 3 Jackson, SW cor. E half, SW, Sec. 88, Blk. B-2, H. & G. N. Sur.	Location.
Edwards et al's No. 1 E. J. Case, NE cor. Sec. 182, Blk. B-2, H. & G. N. Sur.	70,000,000 ft. gas, 2,512-2,630 ft; drlg. by bit, 3,028 ft; 1,000 ft. oil in hole.
Empire G. & F. Co.'s No. A. Barrett, C SW, Sec. 132, Blk. 3, I. & G. N. Sur.	Location.
Empire G. & F. Co.'s No. 1 E. J. Case, C NE, Sec. 180, Blk. B-2, H. & G. N. Sur.	Location.

(Continued on Page 152)

COMPLETIONS
WICHITA FALLS DISTRICT

Archer County

Consolidated Oil Co. and Apple-Brandeberry Oil Co.'s No. 1 Stevens Roach was dry and abandoned at 1,100 feet. Panhandle Oil Co. and Grisham's No. 2 Farmer had an initial production of 98 bbls. found in the oil sand from 1,530-38 feet. Panhandle Oil Co. and A. W. Johnson's No. 1 Garvey found sandy lime from 722-76 feet with an initial production of 80 bbls. on the pump. The Texas Company's No. 1 Garvey-B was dry and abandoned at 1,203 feet. Wright and others' No. 3 Wilson has 10 bbls. of oil and 8 bbls. of water from sands at 1,078-80 feet and 1,081-87 feet. Boller's No. 4 Gragg pumped 23 bbls. from 743-51 feet and 759-68 feet. Boller's No. 5 Gragg pumped 20 bbls. of oil from sands found at 733-36 feet and 740-60 feet.

Foard County

The Texas Company's No. 1 Walk- was dry and abandoned at 3,720 feet.

Wichita County

Dale Oil Corp.'s No. 5-A Kemp-Kemper-B was dry and abandoned at the depth of 1,775 feet. George W. Maywood's No. 1 McBurney has 10 bbls. production at

the depth of 860-62½ feet. Shappell Oil Co.'s No. 10 Kemp-Kemper was completed for 25 bbls. from 1,614-24 feet. Shappell Oil Co.'s No. 11 Kemp-Kemper is producing 20 bbls. from 1,622-30 feet. Vergate Oil Co.'s No. 2 Kemp-Kemper (Dep.) is a temporarily abandoned location.

Wilbarger County

Consolidated Oil Co. and others' No. 1 Anderson has been dry and abandoned at the depth of 2,405 feet. Fain-McGaha Oil Corp.'s No. 2 Waggoner-R has a production of 114 bbls. in the oil sand found from 2,284-99 feet and was drilled to a total depth of 2,301 feet. Humble Oil Co.'s No. 21 Waggoner-H has been plugged back to 2,390 feet from the depth of 2,435 feet and is swabbing 50 bbls. from the oil sand found from 2,370-80 feet. Phillips Petroleum Co.'s No. 12 Waggoner-F is producing 14 bbls. from the sands found at 2,330-33 feet and 2,-396-2,400 feet. The Texas Company's No. 2 Castleberry-B has been dry and abandoned at 2,750 feet. The Texas Company and Staley & Wynne & Co., by steel line measurement found the oil sand from 2,428-29 feet and had an initial production on pump of 25 bbls. of oil and 15 bbls. of water.

Throckmorton County

Associated Petroleum Co.'s No. 4 Cumming was dry at 3,065 feet and has been abandoned. Parker and others' No. 4 Matthews was dry at 1,664 feet and has been abandoned.

Young County

Godley's No. 1-A Graham was drilled to a total depth of 3,425 feet and plugged back to 3,340 feet and has a production of 5,000,000 feet of gas and 10 bbls. of oil from the gas sand found from 3,255-3,340 feet. Ramsey and others' No. 3 Payne has been completed with a production of 200,000 feet of gas from 2,-080-90 feet and 1 bbl. of oil from 2,090-2,110 feet.

NORTH CENTRAL TEXAS AND PANHANDLE
Estimated Daily Average Production for the Week Ending January 14
Wichita Falls District

County—	Prod.
Archer County	26,565
Baylor County	65
Clay County	515
Cooke Coun.y	4,215
Jack County	1,090
Montague County	3,275
Throckmorton County	1,105
Wichita County	26,150
Wilbarger County	9,530
Young County	10,325
Total	82,835
Total last week	85,650
Decrease	2,815
Ranger District	
Brown County	15,121
Callahan County	4,136
Coleman County	1,198
Comanche	1,338
Palo Pinto County	451
Ranger	7,915
Shackelford County	5,365
Stephens County	8,704
Total Ranger district	44,228
Total last week	43,390
Increase	838
Panhandle District	
Carson County	7,375
Gray County	15,705
Hutchinson County	50,630
Moore County	6
Potter Coun.y	25
Wheeler County	990
Total Panhandle district	74,725
Total last week	76,670
Decrease	1,945

RANGER DISTRICT COMPLETIONS

Brown County

Blanchard and associates' No. 1 Kesler was abandoned at 1,345½ feet. The test made 4½ bbls. of oil and 7½ bbls. of water when put on the pump at 1,-338-45½ feet. Cranfill & Reynolds' No. 20 Smith made 50 bbls. initially from 1,338-49 feet. Osage Oil Corp.'s No. 1 Nixon was dry and abandoned at 1,810 feet. Pandem Oil Co.'s No. 1-B Curry made 585 bbls. of 43.1 gravity crude the first 24 hours from sand at 1,114-25½ feet. Selby Oil & Gas Co.'s No. 24 Ellis was dry and abandoned at 1,370 feet. Senior Petroleum Co.'s No. 1 Baker was dry and abandoned at 1,550 feet. Wentz Oil Corp.'s No. 1 Robertson was dry and abandoned at 1,470 feet. Wheelock and Collins' No. 8 Smith was dry and abandoned at 1,340 feet. Curtis' No. 1 Fuller was dry and abandoned at 1,030 feet. Panmico Exploration Co.'s No. 1 Shipman made 1,000,000 feet of gas after an 80-quart shot at 1,300-49 feet and was shut in. West Texas Land Co.'s No. 1 Gwathney was shot with 60 quarts at 1,458-73 feet, plugged back to 1,471 feet and made 20 bbls. of oil and 50 bbls. of water initially.

Callahan County

Mook-Texas Oil Co.'s No. 3 Brown made 40 bbls. initially after a 40-quart shot at 1,668-1,703 feet. Peeples' No. 1 Snyder was dry and abandoned at 1,050 feet.

Coleman County

Manhattan Oil Co.'s No. 1 Overall flows by heads every two or three hours making about 2 bbls. of 42 gravity crude from sandy lime at 2,282-87 feet. The well is shut down for storage. Scarborough's No. 1 Hale was dry and abandoned at 1,265 feet.

Eastland County

Crozelius and others' No. 1 Elliott was dry and abandoned at 1,735 feet.

Shackelford County

Big State Oil Co.'s No. 3 Russ-Webb is a 10-bbl. well at 949-55 feet. Kouri and others' No. 1 Beam was dry and abandoned at 2,003 feet. Roeser and Pendleton's No. 1-A-61, formerly No. 7-F-60, flowed 127 bbls. the first 12 hours from sand at 1,347-64 feet.

Stephens County

Dyar Brothers' No. 1 Black Brothers was dry and abandoned at 3,507 feet. The Texas Company's No. 1 Carey was abandoned at 3,455 feet. Texas-Fidelity Oil Co.'s No. 1 Cook was dry and abandoned at 2,230 feet.

Late News from the Field

OKLAHOMA

The Greater Seminole Field made 335,-109 bbls. for the 24 hours ending at 7 a. m. Tuesday of this week. The production by pools was:

Little River	35,829
Bowlegs	99,864
Earlsboro	123,714
Seminole	55,895
Searight	19,807
Total barrels	335,109

The progress of the Indian Territory Illuminating Oil Co.'s No. 1 School Land in Section 16-8-5 is still being watched with interest, and this well has made several small flows amounting to 150 bbls. in two days. The hole is standing full of oil, and occasionally it slops over. The Simpson sand is being drilled at a depth of 4,283 feet, and the Wilcox sand should be picked up within the next few feet.

The Lovell area of Logan County ranks next to Seminole in importance at this time. The Roxana Petroleum Corp.'s No. 1 Williams, NW cor. NW Section 32-19-4w, flowed 44 bbls. in 12 hours from sand at 6,085-6,100 feet. This is 1¼ miles east of the discovery well. The Roxana Petroleum Corp.'s No. 1 Ross, NW cor. NW Section 29-19-4, three-quarters of a mile north and one-quarter mile east of the discovery well, flowed 724 bbls. the first 20 hours from sand at 6,048-50 feet.

In Lincoln County, the Indian Territory Illuminating Oil Co.'s No. 2 Lindsay, NE cor. NE Section 6-16-5, is flowing 22 bbls. an hour from sand at 4,292-4,305 feet.

KANSAS

A few showings in wildcat wells in Kansas have stimulated interest in that state. In Stafford County, Hooper and others' No. 1 Siffers, NW cor. SW NE Section 23-21-11w, had a showing of oil in chert at 3,396-3,402 feet. Casing will be run before the well is drilled in. In McPherson County, the McPherson Oil & Gas Co.'s No. 1 Anderson, SE cor. NE Section 31-18-2w, has 400 feet of oil in the hole from sand topped at 2,313 feet, which had the first oil at 2,319 feet and a total depth of 2,343 feet. The well is shut down for orders. In Rooks County, Derby Oil Co.'s No. 1 Kruse, NE cor. NW NE Section 3-10-16w, swabbed 60 bbls. in 10 hours after being shot with 60 quarts in sand at 3,085-3,115 feet.

GULF COAST

HOUSTON, Tex., Jan. 17. — Roxana Petroleum Corp.'s No. 1 Wilbert, on the new Whitecastle Dome in Iberia Parish, Louisiana, was bailing salt water with a showing of oil from a sand at 1,580-89 feet. As the sand in this test had given an extremely rich showing it is believed the casing is cemented too high so it will be recemented in an effort to shut off the water. This test has been watched closely for the possibility of opening new dome production. Total depth is 1,593 feet.

Sun Oil Co.'s No. 18 McLean, Spindletop, has been brought in flowing at the rate of 3,254 bbls. daily from sand at 4,875 feet. The latter company's No. 17 McLean came back in as a 1,450-bbl. well after being worked over and deepened to 4,979 feet.

Yount Lee Oil Co.'s No. 25 McFadden, Spindletop, came in flowing at the rate of 2,500 bbls. daily after being worked over. Magnolia Petroleum Co.'s No. 7 fee, depeened to 5,027 feet, came in flowing 600 bbls. net oil.

WINKLER COUNTY

FORT WORTH, Tex., Jan. 17.—Two additional wells in Winkler County are making water. Independent's No. 1, NW cor. SW Section 34, Block B-5, and No. 2, a location east of it, started showing water Monday, each making 2½ per cent water and 1 per cent b.s. No. 1 was completed early in December for 7,508 bbls. at 2,878-79 feet. It had first pay at 2,824 feet. No. 2 was completed the same week for 1,670 bbls. at 2,815 feet. Production of these wells Monday was 11,128 bbls. flowing open. They are on the same structural contours as other water wells in the pool.

EAST CENTRAL TEXAS

MEXIA, Tex., Jan. 14.—The Transcontinental Oil Co.'s No. 1 R. P. Ward, Varella Survey, Cedar Creek district, Limestone County, swabbed 125 bbls. the first 24 hours from sand at 2,873-83 feet. It was not a completion at the time this test was made. W. G. Harrison's No. 1 Williams, on the Varella Surveey, was shut down in lime at 2,785 feet, top of the lime 2,693 feet. Hicks, Hoover and others have started drilling a test on the Richardson land, Bridgeman Survey, Limestone County.

In Freestone County the Orbit Oil Co.'s No. 1 Coleman, Howard Survey, cored salt with a showing of oil at 3,464 feet.

In Anderson County, the Humble Oil & Refining Co.'s No. 3 Spencer Clemmons, Benson Survey, was drilling at 3,996 feet in hard sand. Same company's No. 1 Felix & Smith, Roberts Survey, was drilling in Pecan Gap at 2,759 feet.

In Cherokee County the Humble Oil & Refining Co.'s No. 1 Elliot & Clark was drilling at 4,113 feet in shale.

CALIFORNIA

LOS ANGELES, Calif., Jan 17.—The Chanslor-Canfield Midway Oil Co. got its first production at the new Seacliff-Rincon Field, Ventura County, by finishing Nos. 1 and 2 on the Hobson lease, doing 500 bbls. daily from 2,600 feet.

Milham Exploration's No. 2 Kern, at Buttonwillow, blew in as a 20,000,000-foot gasser from 2,730 feet. This is not an oil gas but has commercial possibilities as the first test also came in as a big gasser several months ago.

New York Standard Answers Deterding About Russian Oil

NEW YORK, Jan. 16. — A statement issued today by the Standard Oil Co. of New York says in part:

"The Standard Oil Co. of New York has until now refrained from making any public comment upon attacks directed against it by Sir Henri Deterding. These attacks have assumed such character, however, that it is considered by the Standard of New York that the public should have the facts. The long distance between the United States and India makes the cost of transport of oil from this country to Indian markets a substantial item. If, therefore, Russian oil could be supplied to Indian markets at a fair price there was obvious economy in shipping such oil from Black Sea ports by saving at least 5,000 miles distance."

The statement says further that it would appear the views of the Standard of New York regarding Russian oil are in accord with the views of both the United States and British governments. The New York company also maintains that the Dutch-Shell prior to the arrangement being made between the Standard of New York and the Russians had been seeking a monopoly for the sale of Russian products for a term of years, these negotiations being carried on from May to December, 1926, and that the Dutch-Shell had actually purchased some 200,-000 tons of Soviet oil as far back as 1922. The New York company also says the Dutch-Shell has reduced prices in India below the levels dictated by economic considerations with the result that the Shell stands to lose 25,000,000 rubles a year and the Standard of New York approximately 11,500,000 rubles yearly.

In closing the statement says: "The Standard Oil Co. of New York will not be swerved in any manner from its clearly-conceived policy by such desperate and destructive measures as are being followed in India and threatened in other parts of the world."

SOUTHERN GAS MERGED IN HOUSTON SECURITIES

SAN ANTONIO, Tex., Jan. 16.—Consummation of the sale of the Southern Gas Co. of San Antonio to the Houston Gas Securities Co. for $3,500,000 in Kansas City Saturday is practically the final step in a $35,000,000 merger of Southern Gas and subsidiaries with Houston Gas Securities and its subsidiaries which will get its natural gas supply from more than a dozen fields and will supply natural gas to most of the cities in 50 counties in south and southwest Texas. Dixie Gas Co.'s 22-inch pipe line from northern Louisiana to Beaumont is part of the merger.

The merger of the two companies, President Leroy J. Snyder of the Southern Gas Co. said, would result in a daily combined output of gas in excess of 100,-000,000 feet and the companies' reserve supply of gas would be in excess of 4,-000,000,000 feet.

Under the terms of the merger, 55,000 shares of the common stock of the Southern Gas Co. passes into the hands of the Houston company, which is a holding company for the Empire Power Corp. of New York.

INSTALLING ELECTRIC UNITS

SAN ANGELO, Tex., Jan. 14.—Illinois Pipe Line Co., which has a line running south from the Yates Pool to the Illinois company's 2,000,000-bbl. tank farm at Del Rio, is installing electric units in its station to drive pumps. Installations have been made at Iraan and at Fort Langston and each unit can develop 800 horsepower. In the near future a 400-horsepower unit will be added to the Iraan station. Linemen are stringing a line to connect with the Val Verde station.

Water on Northwest Edge of Yates Pool

Daily Average Production of West Texas Fields Increased to New Record by 20,000-Bbl. Gain in Winkler County

By C. D. Lockwood
Staff Correspondent, West Texas Fields

FORT WORTH, Tex., Jan. 16. — Appearance of sulphur water on the northwest edge of the Yates Pool of Pecos County, and a 20,000-bbl. jump in daily average production constituted the most important news features from West Texas fields during the past week.

The 20,000-bbl. production increase was caused by Winkler County, as forecast last week. That county reached a high figure of 92,000 bbls. one day last week and averaged 83,520 bbls. for the week. Pecos County also increased to 54,000 bbls. and these two gains put the West Texas total up to 281,654 bbls., a new high peak for all time. Recent completions in the Hendricks Pool indicate a still higher figure will be attained in Winkler County the coming week, although some of the wells may have to be pinched sufficiently to offset the normal increase.

Water Situation

The water situation on the northwestern side of the Yates Pool is somewhat similar to that on the eastern edge which monopolized attention last November. The new wells are all situated on the 1,260-foot contour line, as regards top of the lime, and that has been regarded as pretty close to the water level—within 10 or 20 feet, structurally. It seems evident that the edge of the pool has been fairly well defined in that direction although it is likely that good oil production will be obtained farther west than Kirby Petroleum Co. and Edson's No. 1 Tippett, which marks the northwestern limit of the field at present.

Kirby and Edson's No. 1 Tippett, which made 78 bbls. in one hour when tested December 1 for the proration gauge, started making 11 per cent water this week but when pinched the percentage dropped to 1 per cent. This well has a surface elevation of 2,541 feet and topped the lime at 1,278 feet, making it 1,263 feet above sea level.

Gulf Production Co.'s No. 4 Yates, east offset to Kirby-Tippett, came in this week flowing 20 bbls. an hour and began showing a little water soon afterward. It was pinched to 5 bbls. hourly and after pinching showed no water. Gulf's No. 5 Yates, in the SW cor. of the Runnels County School Land, also was brought in this week for 20 bbls. hourly but showed 10 per cent water when it was flowing open. Like No. 4, it was pinched to 5 bbls. an hour and the sulphur water content was reduced to 1 per cent.

McMan Oil & Gas Co.'s No. 1 Tippett (or Richardson), south offset to the Kirby well, made a little water and was shut in.

Humble Oil & Refining Co.'s No. 3 Smith-B, in the NW cor. of Section 101, Block 194, offsetting Gulf's No. 5 and McMann's No. 1, was pinched to 247 bbls. and was showing 3 per cent water.

Depths of Wells

Following are the depths at which the foregoing wells topped the lime, in feet above sea level:

Kirby & Edson's No. 1 Tippett	+1,263
Gulf Prod. Co.'s No. 4 Yates	+1,263
Gulf Prod. Co.'s No. 5 Yates	+1,261
McMan O. & G. Co.'s No. 1 Tippett	+1,268
Humble O. & R. Co.'s No. 3 Smith-B	+1,265

All of these wells have been relatively small producers, Kirby's having been the largest. It made 78 bbls. an hour at 1,293-1,465 feet. Humble's No. 3 Smith-B flowed 45 bbls. an hour at 1,316-1,460 feet.

The Kirby well is therefore 202 feet in the lime and the Humble well is 195 feet in it. The Gulf wells are about 150 feet in the lime.

Most of the big production in the main part of the pool is found close to the top of the lime and some of the big wells are actually producing from what is termed "trash" just above the lime. An interesting example of this is Gulf Production Co.'s No. 7 Yates, located on the south line of the Runnels County School Land offsetting Simms Oil Co.'s tract. This well, with surface elevation of 2,393 feet, started flowing by heads this week at 1,050 feet and increased to 450 bbls. per hour at 1,073-75 feet. It was estimated good for 10,800 bbls. daily at that rate. Gravity is 29.8 degrees. According to geologists who have examined samples, this production is coming from a formation of sand, shale and other loose material above the big lime.

Subtracting the total depth of this well from the surface elevation, the result is plus 1,318 feet, which is somewhat higher than geologists figured the formation would be in that direction, and it will probably add considerable proven acreage to the Gulf's total on the Runnels County School Land lease.

Yates Pool Limits

The Yates Pool was further defined during the past week when Simmons Oil Co. topped sulphur water at 1,285 feet in its No. 1 Halff, located in the NE cor. of Section 69, Block 1, on the Crockett County side of the Pecos River, about half a mile downstream from Osage Oil Corp.'s No. 1 Halff which flowed 327 bbls. in 30 minutes on a flow test last week. The Simmons well topped the lime at 1,230 feet and was shut down at 1,290 feet. It will be plugged back to test gas sand at 865-71 feet and 930-40 feet where it had 1,000,000 feet of sweet gas. If these gas sands can be made to produce, the gas will be furnished to the town of Grube, near by.

The Yates Pool was likewise extended. Mid-Kansas and Transcontinental's No. 2 Smith, NE cor. Section 31, Block 194, a little more than a mile south of production, topped the pay at 1,110 feet and at 1,126 feet the hole filled up 900 feet with oil. At 1,140 feet it made a 34-bbl. flow, with no water. This well is almost directly between two dry holes on the south edge of the pool, No. 1 Smith on the same lease, and George Henshaw's No. 1 Yates in Section 544, Block 1. Getting oil in No. 2 Smith is a victory for Mid-Kansas and Transcontinental geologists and is further proof that the subsurface in this field is strongly reflected in the surface. It will also add some more proven acres to the two companies' totals.

George Anderson and C. E. Menzie's No. 1 Sherbino in Section 14, Block C-4, G. C. & S. F. Survey, about 14 miles southwest of the Yates Pool, topped the salt at 928 feet with surface elevation of 2,876 feet. That figures out about 40 feet higher than the top of the salt in Menzie's old test a mile or so north of it, drilled several years ago to 3,575 feet.

The Fisher County wildcat which created some excitement last week, has been drilled deeper without materially changing its status. Saturday it swabbed 165 bbls. at 3,259 feet in lime. Top of the pay was 3,239 feet. At 3,245 feet the bit went into shale but soon picked up lime again at 3,251 feet.

Winkler County

A big royalty deal was consummated in the Hendricks Pool recently. Douglas Oil Co. purchased from Grisham & Hunter one-sixty-fourth under Sections 35, 36, 40, 41, Block B-5, and Sections 44, 45 and 46, Block 26. The reported consideration was $125,000.

Following is the Winkler County storage report as of January 10:

Company—	Bbls.
Atlantic O. P. Co.	235,190
Independent O. & G. Co.	184,200
Humble O. & R. Co.	112,226
Gulf Prod. Co.	246,700
Roxana Pet. Corp.	96,900
Turman & Maxwell	12,270
Texon O. & L. Co.	81,560
Magnolia Pet. Co.	150,480
Southern Crude at Hardin Sta.	118,440
Southern Crude at Wickett	250,800
American P. L. at Pyote	412,540
American P. L. at Field	8,160
	1,911,526

Independent Oil & Gas Co. started running oil Friday through its 8-inch welded line from the field to a 75-car rack on the T. & P. near Pyote.

WEST TEXAS COMPLETIONS

Crane County

Magnolia Petroleum Co.'s No. 15 University-Hardwicke was shot with 120 quarts at 2,836-79 feet and flowed 390 bbls. afterward. It never made any oil before the shot. Top of pay was 2,821 feet.

Crockett County

Corbett & Gill's No. 1 University was dry and abandoned at 2,315 feet.

Fisher County

Marland Oil Co. and Texon Oil & Land Co.'s No. 1 McCall was abandoned as a location.

Gaines County

Westheimer & Daube's No. 1 Birge & Forbes was dry and abandoned at 5,341 feet. It had 4,000 feet of sulphur water at 5,300 feet.

Howard County

Sweeney and others' No. 5 Otis Chalk swabbed and flowed 150 bbls. at 1,693-1,701 feet. The California Co.'s No. 1 Fisher was also abandoned as dry at 3,833 feet. Ward Oil Co.'s No. 1 Dora Roberts flowed 85 bbls. natural at 1,819-39 feet, total depth 1,840 feet, and was completed.

Pecos County

Allsman & Bell's No. 5 River Bed flowed 200 bbls. per hour, 50 per cent water, at 925-35 feet. Red Bank Oil Co.'s No. 1 Arthur Harral was dry and plugged at 3,001 feet. Roxana Petroleum Corp.'s No. 7 J. H. Tippett flowed 495 bbls. per hour, open, at 1,180-1,278 feet. California Co.'s No. 7 Mrs. M. A. Smith, Lease 3, flowed 350 bbls. per hour at 1,145-1,290 feet.

Cummings and others' No. 1 Blackstone & Slaughter was plugged and abandoned at 2,528 feet.

Gulf Production Co.'s No. 4 Yates flowed 20 bbls. per hour at 1,421 feet, but had to be pinched to 5 bbls. per hour because of water intrusion. After pinching, it made one-half per cent b.s. and one-half per cent water. Same company's No. 5 Yates also flowed 20 bbls. hourly at 1,412 feet, making 10 per cent b.s. and water. It was likewise pinched to 5 bbls. hourly. No. 7 Yates started flowing by heads at 1,050 feet and increased to 450 bbls. hourly at 1,073-75 feet. It was estimated good for 10,800 bbls.

ESTIMATED DAILY AVERAGE PRODUCTION WEST TEXAS
Week ending January 14, 1928

Big Lake Field	22,032
Crane County	93,014
Crockett County	2,602
Ector County	15
Glasscock County	S. D.
Howard County	6,420
Jones County	1,230
Loving County	60
Mitchell County	3,355
Pecos County	54,261
Runnels County	80
Scurry County	45
Upton County	15,020
Winkler County	83,520
Total West Texas	281,654
Total last week	260,758
Increase	20,896

WILDCAT OPERATIONS IN WEST TEXAS

Week ending January 14, 1928

ANDREWS COUNTY

Company, farm and location—	Remarks—
George B. Calvin's (was Calvin & Belt's) No. 1 Ratliff & Bedford, C NE Sec. 16, Blk. A-54	Hole full fresh water 1,055 ft.; top salt 1,610 ft.; shut down 4,003 ft.
J. S. Cosden's No. 1 Ratliff & Bedford, C SE Sec. 8, Blk. 73, Public School Land	Top salt 1,585 ft.; shut down 4,116 ft.; will deepen.
Deep Rock Oil Co.'s No. 1 W. J. Harris, C SE Sec. 12, Blk. A-46, Public School Land, elev. 3,167 ft.	Hole full fresh water 1,050 ft.; total depth 1,513 ft.; underreaming at 1,400 ft.
B. B. McKennon's (was Neff et al's) No. 1 J. S. Means, C SE Sec. 12, Blk. A-35, Public School Land	Set 8-in. 1,580 ft.; shut down 1,620 ft.
A. G. Carter & Zweifel's No. 1 Cowden, C SE Sec. 18, Blk. A-52, Public School Land Sur., elev. 3,156 ft.	Top salt 1,375 ft.; encountered pocket of air 3,635 ft.; total depth 5,000 ft.; contract complete.

BORDEN COUNTY

Dixon Creek Oil Co.'s No. 1 Clayton & Johnson	Moving in material.
Marland Oil Co.'s No. 1 G. E. McDavid, C SW Sec. 156, Blk. 25, H. & T. C. Sur., elev. 2,310 ft.	Drlg. 1,475 ft.

BREWSTER COUNTY

Cowden & Bowser's No. 1 Jackson & Harmon	Drlg. 600 ft.
J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G. H. & S. A. Sur.	Shut down 910 ft.
Mid-Kansas O. & G. Co.'s No. 1 Turney, Sec. 77, Blk. 213, T. & St. L. Sur.	Drlg. 2,685 ft.
Reese & White's No. 1 Kimbale, C NE Sec. 204, Blk. 9, G. H. & S. A. Sur.	Underreaming 6-in. 1,306 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine	Shut down 1,210 ft.
Wilcox & Anderson's No. 1 Gage, Sec. 8, Blk. 300, T. C. R. R. Sur.	Drlg. 1,901 ft.

COKE COUNTY

W. H. Brown et al's No. 1 W. L. Foster, SE cor. Sec. 142, Blk. 2, H. & T. C. Sur., elev. 2,222 ft.	Shut down 2,250 ft.
Danciger O. & R. Co.'s No. 1 Mrs. Byrnes, Clinton Sur.	Drlg. 2,385 ft.
Lipan Oil Co.'s No. 1 S. M. Conner, Sec. 71, Blk. 2, H. & T. C. Sur.	Show oil 1,224-34 ft.; shut down lime 3,317 ft.
Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H. & T. C. Sur., elev. 2,750 ft.	Total depth 2,736 ft.; shut down.

CONCHO COUNTY

Parks & Lawson's No. 1 Schultz	Show oil 925 ft.; shot with 40 and 30 qts.; no results; shut down 1,500 ft.
The Exploration Co.'s No. 1 Hartgrove, Blk. 240, J. Schouch Sur., elev. 1,718 ft.	Set 10-in. 760 ft.; shut down 980 ft.

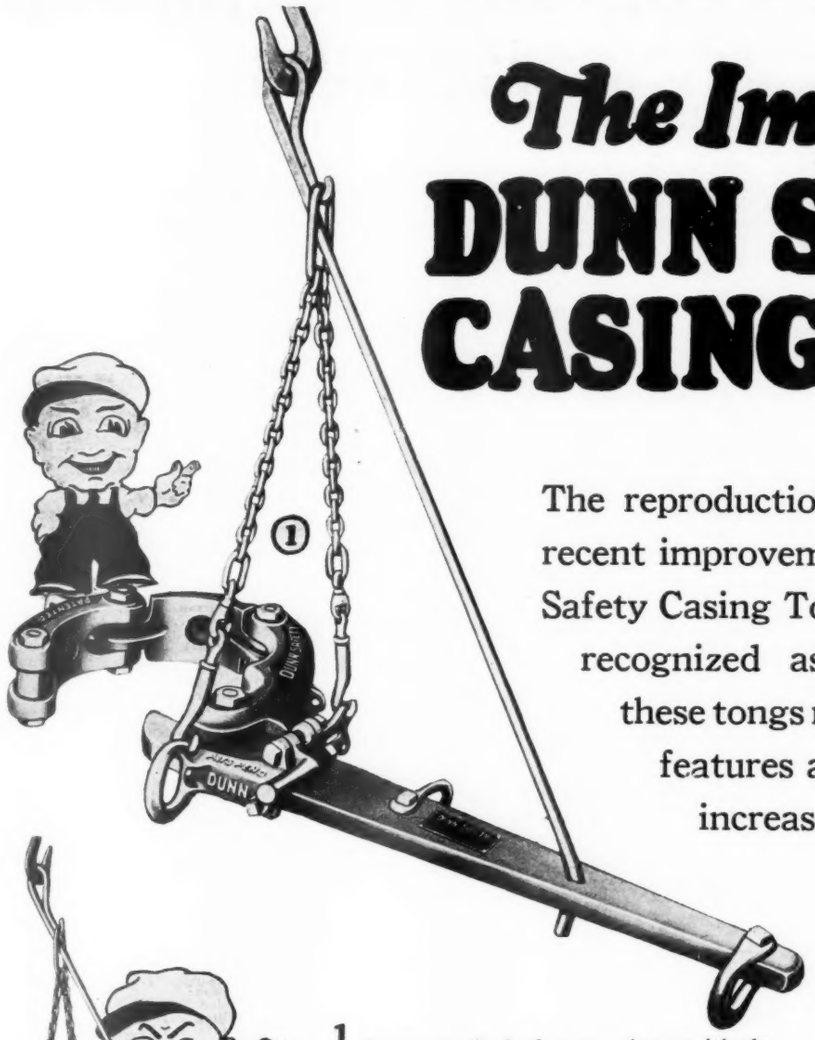
CRANE COUNTY

Crane Dev. Co.'s No. 1 J. R. Mosley, S cor. Sec. 18, Blk. 6, H. & T. C. Sur.	Drlg. 910 ft.

(Continued on Page 150)

DUNN TOOLAGRAM

The Improved DUNN SAFETY CASING TONG

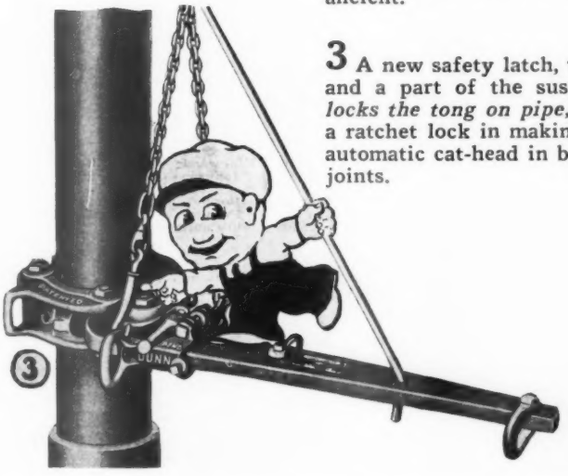


The reproductions shown here illustrate recent improvements in all sizes of Dunn Safety Casing Tongs. Always universally recognized as the world's standard, these tongs now have numerous added features and we guarantee greatly increased value and satisfaction.

1 A new method of suspension positively holds tong in perfect balance at every position, open or closed.

2 The complete suspension fits on any Dunn Casing Tong Handle by simply placing the link on handle and locking it in position with set screw, and will greatly improve and facilitate the handling of your present Dunn Tongs, no matter how ancient.

3 A new safety latch, which is adjustable and a part of the suspension, *positively locks the tong on pipe*, and also serves as a ratchet lock in making up casing or for automatic cat-head in breaking rotary tool joints.



With this perfect balance under all conditions, together with the new conveniently placed hand-grips, these tongs are unsurpassed for safety, speed and convenience in handling.

Another exclusive and unique suspension, which locks on the pipe and holds the tong may now be had where double table rotary is used in making up casing. We, also, now furnish Dunn Safety Casing Tongs with special short handles for use on make and break rotary posts of other manufacturers.

All hinge-pins are now made of a most unusual steel especially heat-treated, reducing bending and breaking to an absolute minimum.

Principal parts are made stronger but remain interchangeable with all tongs previously made.

These improvements are additional evidence of Dunn accomplishments where *Safety, Strength, Speed, Durability* and ease in handling are demanded.

DUNN
MANUFACTURING COMPANY
OXNARD, CALIFORNIA

Mid-Continent Branch Warehouse
215 East Archer St. Tulsa, Oklahoma

Export Sales Office
150 Broadway, New York City

Plan Drilling Program at Seminole

Likely to Start 300 Wells in Potential Areas After Expiration of Agreement on March 1. Watching I. T. I. Well

By J. L. Dwyer
Staff Correspondent, Oklahoma Fields

For the first time in many months, oil is being taken out of storage in the Oklahoma and Kansas territory. This important development is bound to be reflected in the price structure, or else in the Seminole agreement being abrogated, for the crude purchasing companies do not care to take oil which costs around $1.90 per barrel out of storage and apply it on current contracts which yield $1.26 per barrel. The turning point is believed to have been passed at the time when the companies stopped putting oil into the tanks and began removing it. There is no cause for alarm, and there most certainly is no impending shortage of oil. The entire industrial structure would probably be much improved if the crude stocks in the Oklahoma-Kansas territory were reduced several million barrels, but crude stocks are peculiar things; all hands are loath to increase them very much, but all hands become startled when confronted with the prospect of reducing them. It would be interesting to ascertain just what is the proper amount of crude storage.

In the field, the week continued quiet, and the operations have shown little increase from the holiday lull. Except for the Seminole area, there is little news of an unusual character, and the West Texas fields seem to interest the companies and operators more than any parts of Oklahoma except Seminole.

Seminole Prospects

The Seminole agreement very likely will endure until March 1, and talk of breaking it and throwing drilling wide open has subsided. With six weeks to run before the termination of the agreement, it is hardly possible that the operators will upset the plans of the umpire and the advisory committee, but on March 1 there will be at least 300 wells started in the outlying pools and potential pools of the Seminole region. It is now believed that the companies will drill up the rest of the outlying leases, according to plans which call for the starting of two wells to each 40-acre tract of lease. When one or both of these wells has been completed, then one or two new wells may be started, and by this method, the development will be moderate, and the crude market will be saved having a flood of crude thrown upon it when the first batch of wells are completed. The new production will likewise be spread out over the summer months instead of coming all in a rush during the month of June. The plan to start two wells to the 40 acres has been under consideration for several weeks, and it is believed that the owners have almost all agreed to this procedure.

Important Well

The most important well in Oklahoma at this time is the Indian Territory Illuminating Oil Co.'s No. 1 School Land, SE cor. SW, Section 16-8-5, which is running unusually high on the structure, and which has a hole full of oil from the Simpson sand found 4,273-78 feet. This well made two small flows estimated at 75 bbls., and the boiler is being moved back to keep out of the danger zone, as there is some gas present in the well.

The companies and individuals are observing this well very closely, and while feeling is very optimistic regarding the well's prospects, it should be recalled that several good prospects in this area have blown up when the Wilcox was touched. The Barnsdall Oil Co.'s No. 1 Holutke, in Section 22-7-6, was another well which had great possibilities from a structural standpoint but which was a failure in the Wilcox. Incidentally, the Holutke well flowed from the Simpson sand just as the present Indian Territory company well is doing. In this part of the State, it seems that underground conditions are deceptive, and the highs are not always indicative of production.

Logan County

In the mile-and-a-half-deep producing region of Logan County, the Roxana Petroleum Corp.'s No. 1 Ross, NW cor. NW, Section 29-19-4w, is flowing 55 bbls. an hour in the Wilcox sand found 6,048-52 feet. This well is three-quarters of a mile east of the Roxana Petroleum Corp.'s No. 1 McCully, the discovery well of the pool, which is located SW cor. NE SE, Section 30-19-4w. It improves the prospects of the Lovell Pool which were slightly dimmed by the disappointing record of the same company's No. 1 Stevens, SW cor. SW, Section 29, south and west from the discovery well.

Seminole Production

Production of the Greater Seminole area for January 13 by companies and leases follows:

Little River

Company, Farm—	Wells	Prod.
Amerada:		
Fore	2	1,280
Nitey	3	2,655
Barnsdall:		
Hotulke	1	....
Blackwell:		
Nitey	8	1,092
Carter:		
Fish	4	1,150
Jackson	1	100
Continental:		
Cosar	2	620
Brown	1	50
Gypsy:		
Campbell	2	140
Nungee	1	35
Pottey	3	540
Wadsworth	1	....
Independent:		
Harris	1	104
Davis	2	1,942
Indian Territory:		
Campbell	1	175
Dungan	3	2,479
House, M. A.	1	396
House, W. E. "A"	1	22
House, W. E. "B"	1	1,942
Jackson	3	3,491
McCulla	3	1,097
Nitey	6	1,453
Phoebe, "A"	3	946
Phoebe, "B"	3	431
Reed	1	156
Soketheche	4	1,006
Hull	1	118
Magnolia:		
Cruse	1	750
Pottey	2	645
Mid-Continent:		
Wadsworth	7	1,200
Smith	1	35
Pine & Phillips:		
Pottey	1	1,095
Prairie:		
Dungan	2	180
House	4	2,320
Roxana:		
Smith	1	15
Shaffer:		
Narcone	1	150
Sinclair:		
Cosar	1	1,125
Superior:		
Wadsworth	1	21
Snowden & McSweeney:		
Tiger	1	215
Texas:		
Coker	3	695
Tidal:		
House	3	1,660
Johnson	1	50
Total	95	35,876

Bowlegs

Amerada:		
Rasco	8	3,100
Atlantic:		
Baker	4	654
Fleet	4	510
Grayson	3	889
Jones, A.	3	109
Jones, C.	2	489
Barnsdall:		
McNac	1	37
Murrow	4	1,048
Carter:		
Bowlegs	3	1,230
Burden	3	415
Harjoche	6	960
Hilly	2	650
Jones	3	2,290
McGeisey	1	30
Melisse	1	880
Walker	3	480
Wise	12	5,595
Empire:		
Lacy	6	811
Wise	2	860
Gypsy:		
Bowlegs	1	210
Bradley	1	30
Cumsey	4	1,747
Dosar	1	100
Grayson	4	1,327
Harjoche	1	1,132
Henderson	1	....
Jones	1	500
Walker	8	2,415
Wise	3	110
Indian Territory:		
Barnett A.	2	344
Barnett, B.	1	156
Billington	5	565
Bowlegs	11	1,310
Burden	1	11
Davis	4	1,878
Fay	9	4,181
Goforth	11	1,598
Livingston	11	4,538
Lizzie	2	781
Walker	8	1,307
Wilmont	4	1,087
Work	1	13
Youngblood	2	140
Magnolia:		
Davis, B. F.	1	658
Davis, M.	1	471
Hammond	2	126
Rhoades	2	5,174
Van Buskirk	1	452
McColloch:		
Bowlegs	3	307
Mid-Continent:		
Baker	4	2,095
Bowlegs	1	40
Hufke	1	1
Smith	3	800
Minnehoma:		
Bowlegs	3	200
Prairie:		
Gahagan	4	675
Harber	8	3,710
Jones	4	1,075
Templeton	4	3,270
Whitney	4	430
Pure:		
Reed	15	4,278
Strothers "D"	4	764
Strothers "E"	1	....
Strothers "F"	3	1,293
Roxana & Houston:		
Taylor	6	1,528
Shaffer:		
Lacy	3	522
Sinclair:		
Bowlegs	1	30
Cumsey	3	6,785
Ellen	6	2,241
Harjo	3	1,020
Jones	6	5,512
Taylor	4	3,845
Walker	4	885
Texas:		
Reed	10	3,345
Tidal:		
Grayson	3	1,260
Harjoche	6	2,320
Twin States:		
Jones	2	....
Total Bowlegs	298	101,633

Earlsboro

Amerada:		
Anderson	3	1,575
Cowden	8	2,340
Rodgers	3	2,290
Barnsdall:		
Brown	4	2,357
Bruner, F.	2	813
Bruner, N.	4	1,683
Cudjo, C.	1	27
Davis, D.	3	1,824
Davis, J.	4	755
Davis, M.	3	1,760
Gibson	7	2,569
Hearn	1	6
Ingram	7	4,865
Pack	4	178
Peter	4	75
Sango	3	3,296
Sebolka	1	890
Sullivan, H.	2	38
Sullivan, Harjo	3	83
Wasutke	4	1,464
Carter:		
Davis	1	185
Payne	3	790
Sango	4	5,210
Continental:		
Kays	2	350
Spencer	4	2,055
Crosbie:		
Bryant	2	35
Empire & Routt:		
Barker	1	2,692
Empire:		
Edmundson	3	1,212
Gypsy:		
Bruner	4	2,187
Carter	11	3,270
Earl	1	20
Hunick	1	2,257
Bora	1	7
Noble	4	4,997
Peter	6	155
Sango	4	6,787
State	4	1,142
Independent:		
Bruner	4	30
Sullivan	4	20
Knapp	5	3,009
Gaines	2	1,165
O'Dell	4	20
Inter-Ocean:		
Payne	1	....
Magnolia:		
Bryant	6	2,319
Cowden	4	57
Dixon	1	42
Edmundson	3	24
Holmsley	8	4,478
Ingram	1	35
Lena	3	84
Seay	9	5,270
Simpson	4	388
Sparks	7	2,824
Sullivan	3	485
Mid-Continent:		
McCumber	7	920
Mid-Kansas:		
Anderson	4	355
Phillips:		
Dunnaway	1	20
Graham	7	195
Prairie:		
Baker	1	50
Davis	4	1,165
Graham, C.	2	70
Graham, O.	4	2,210
Stidham	12	5,575
Roxana:		
Bayliss	1	18
Spencer	2	2,436
Shaffer:		
Clark	5	1,378
Sinclair:		
Foreman	1	15
Hollins	3	750
Sango	1	3,950
Skelly:		
Spencer	2	831
Texas:		
Anderson	6	1,260
Brown	8	2,420
Rodgers	4	5,645
Wilmont	6	3,635
Tidal:		
Watkins	8	2,950
Twin State:		
Barker	3	125
Hearn	3	6,410
Total Earlsboro	291	124,020

Seminole

Carter:		
B. Carter	2	200
J. Carter	3	38
F. Carter	3	85
Creamer	2	17
R. Cudjo	4	335
W. Cudjo	2	13
Gilliland	2	325
Grisso, M.	1	410
Grisso, W.	5	1,050
Knapp	3	7
Killing, M.	12	8,000
Killing, G.	4	770
Lukes	7	1,577
Ponder	2	38
Simpson	3	102
Strother	4	475
Vierson	3	300
Amerada:		
Fixico	4	1,076
Killing	4	555
Rentie	3	545
Atlantic:		
Cudjo, N.	3	570
Barnsdall:		
Carter	8	1,581
Henry	2	581
Jones	4	1,090
Empire:		
Gross	3	122
Wilson	2	376
Gypsy:		
Butler	4	1,195
Carter	8	535
Cudjo	5	580
Fixico	7	150
Harjo	3	855
Wolf	6	155
Independent & McCulloch:		
Butler	3	1,050
Independent:		
P. Fixico	3	250
Harjo	3	315
Independent & Garland:		
T. Fixico	8	615
Independent & Interocean:		
Jones	4	518
Indian Territory:		
Allen	2	402
Bowlegs	12	2,426
Fleet	1	11
Gooden	4	324
Harjo	4	102
James	4	226
Reed	3	22
Kingwood:		
Johnson	3	1,284
Magnolia:		
Born	1	33
Franks	4	904
Mid-Continent:		
Rentie	9	1,180
Tayeche	7	345
Mid-Kansas:		
Wilkins	1	148
Phillips:		
Strothers	2	57
Prairie:		
Gross	5	115
Mason	1	110
Spencer	1	15
Strother	8	1,370
Pure:		
Strother, A.	17	4,600
Strother, B.	5	1,828
Strother, C.	1	122
Roxana:		
Harber	2	290
Lashley	2	43
Sinclair:		
Carter	2	25
Cudjo, A.	6	1,000
Cudjo, B.	4	1,100

Flashing

Dubbs Licensees can now add the Dubbs Flashing System and obtain

50 to 55% gasoline (Knoxless-Pullsmore)

47 to 42% marketable fuel oil and distillate

3% coke, gas and loss

and be on stream 95% of the time

The coke will be less than one pound per barrel run

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

Dicey	2	1,500
Fixico	4	670
Slick:		
Cudjo	3	705
Franks	8	1,160
Giblet, Sam	3	2,301
Tiger	1	30
Superior:		
Cudjo	4	440
Texas:		
Mayhue	1	305
Strothers	3	130
Tidal:		
Carter	4	712
Fixico	6	676
Harjo, D.	3	770
Harjo, T.	6	260
Mahardy	2	190
Turman:		
Cudjo	4	1,054
Grisso	1	268
Jones	4	955
Total	319	56,738
Searight		
Carter:		
Davis	7	1,410
Frazier	6	3,630
Johnson	1	10
Kiker	1	30
Mandler	2	40
Scott	1	30
Amerada:		
Johnson	1	80
Strother	2	1,417
Gypsy:		
Cudjo	4	575
Mid-Continent:		
Grayson	6	55
Soloche	3	1,445
Pine:		
Lulla	1	....
Prairie:		
Cannon	1	25
Carter	1	20
Houck	1	8
K'ncaid	5	70
Wiemer	1	20
Superior:		
Varnum	1	....
Pure:		
Aldridge	6	3,333
Roxana:		
Strother		2,035
Sinclair:		
Polly	4	2,200
Texas:		
Fleet	1	40
Twin State:		
Varnum		518
Wilcox:		
Chupco	8	2,615
Total	70	19,606
Total Little River	95	35,876
Total Bowlegs	298	101,633
Total Earlsboro	291	124,020
Total Seminole	319	56,738
Total Searight	70	19,606
Grand total	1,073	337,873

Beckham County

Fred Coogan's No. 1 Rosenbaum, NE cor. SE SE, Section 20-9-23w, Sayre district, was drilled to 2,600 feet and is estimated good for 60,000,000 feet of gas.

Caddo County

Moran and others' No. 2 Cutshall, SE cor. NW, Section 5-5-9w, is making 40 bbls. from a series of sands at 1,838-2,420 feet.

Creek County

Shaffer Oil & Refining Co. has the rig on the ground for No. 16 L. Tiger, SE cor. NW SW NW, Section 17-17-7, Drumright Pool. Hemlock Oil Co. has a machine at the location for No. 1 Thomason, NW cor. NE SW, Section 35-18-10. Chief Drilling Co. has built the rig for No. 1 Brown, SE cor. Section 1-17-10. Irelan and others' No. 1 Thomas, SW cor. SE NW, Section 13-17-10, is an old well being deepened from 2,540 feet and now drilling at 2,650 feet. J. Winemiller has moved a machine out for No. 1 Deenun, SE cor. NW, Section 4-17-11. Riverland Oil Co. has the rig up for No. 1 Marshall, SW cor. SE SE, Section 31-14-9.

F. R. Billingslee and others' No. 2 Lewis, SW cor. Section 10-15-8, has been shut in for 30,000,000 feet of gas in the Dutcher sand at 3,175-85 feet. Pioneer Petroleum Co.'s No. 14 Bucktrot, NE cor. NW NE NE, Section 24-17-10, has been completed for 1,000,000 feet of gas in the Dutcher sand at 2,445-46 feet, total depth 2,517 feet. Wilcox Oil & Gas Co.'s No. 4 Dixon, NW cor. SE, Section 18-14-10, Hall-Donnelly Pool, made 225 bbls. from Wilcox sand at 3,394-3,407 feet.

Grady County

Meridian Gas Co. is cementing surface pipe on No. 4-A K. Farwell, NE cor. SE, Section 23-5-8w. Oklahoma Gas Utilities Corp.'s No. 2 Wood, NE cor. NW, Section 2-4-8w, is cementing surface pipe. The Texas Company has the rig up for No. 2 Glover, NE cor. SW NW, Section 13-4-8w. Magnolia Petroleum Co. is erecting a rotary rig for No. 1 Pursley, SE cor. SW NW, Section 8-4-6w. Carter Oil Co.'s No. 1 W. E. Polson, NW cor. NE SW, Section 27-3-5w, is cleaning out at 1,425 feet preparatory to deepening.

Oklahoma Gas Utilities Corp.'s No. 2 Sanford, NE cor. SE SW, Section 23-5-8w, set the 8-inch casing at 2,030 feet, drilled to 2,305 feet and is shut in for 10,000,000 feet of gas. No. 5 Dryden, SE cor. SW SE, Section 35-5-8w, was completed for 56,000,000 feet of gas at total depth of 2,400 feet. Magnolia Petroleum Co.'s No. 1 Ramsey, C NW NE, Section 10-4-8w, has been abandoned at 3,625 feet. Harwell and others' No. 2 Pendley, C NE NW, Section 14-4-8w, set 8-inch casing at 2,185 feet, drilled to 2,478 feet and gauged 39,000,000 feet of gas. Carter Oil Co.'s No. 1 Tims, SW cor. NE, Section 17-4-6w, has been completed for 3,500,000 feet of gas in sand at 1,836-50 feet.

Greer County

Magnolia Petroleum Co.'s No. 1 Churney, NE cor. Section 19-7-22w, has been abandoned at 3,422 feet.

Kay County

Harris & Haun have the cellar and ponds dug for No. 2 Tickle, NE cor. SE, Section 25-29-1w. No. 2 Hobough, SW cor. Section 30-29-1, is drilling at 120 feet.

Carter Oil Co. and Oma Oil Co.'s No. 6 Shimp, C SW SW, Section 17-29-1, was completed for 2,168,000 feet of gas in sand at 1,450-85 feet, total depth 1,495 feet. Waggoner and others' No. 1 Fruits, NW cor. NE NE, Section 3-25-2w, has been abandoned at 1,442 feet.

Lincoln County

Wilcox Oil & Gas Co. has the rig on the ground for No. 1 Skeets, NE cor. Section 15-15-5.

Osage County

Peters Petroleum Co. is building the rig for No. 3, NE cor. NW SW, Section 26-25-9. Marland Oil Co. has moved the rig out for No. 4, SE cor. NE SE, Section 27-25-9. Kay County Gas Co. made location for No. 1-A, C SW NE, Section 22-24-7. No. 1-B has been located at C NW SE, Section 22-24-7. J. A. Kennedy made location for No. 2, SE cor. SW SW, Section 29-20-12.

Peters Petroleum Co.'s No. 8, SE cor. NW, Section 17-27-6, Burbank Pool, had Burbank sand at 2,901-61 feet from which it made 1,650 bbls. naturally. Phillips Petroleum Co.'s No. 3, SW cor. SE SE, Section 17-27-6, made 617 bbls. naturally from Burbank sand at 2,894-72 feet. Gypsy Oil Co.'s No. 3, NE cor. NW, Section 28-27-6, was completed for 982 bbls. naturally in the Burbank sand at 2,912-82 feet, total depth 2,985 feet. Kewanee Oil & Gas Co.'s No. 7, NE cor. SW NE, Section 3-26-6, had Burbank sand at 2,768-2,829 feet, total depth 2,838 feet, and made 415 bbls. after the shot. No. 9, SW cor. NE NE, Section 3-26-6, is making 40 bbls. an hour after shooting the Burbank sand at 2,736-2,812 feet. Indian Territory Illuminating Oil Co.'s No. 384, NE cor. SW SE, Section 20-25-12, has been completed for 3,750,000 feet of gas in Wilcox sand at 2,054-67 feet.

Okfuskee County

Schermerhorn Oil Co. and others' No. 1 Dwyer, C SW NW, Section 21-10-9, has been shut in for 43,000,000 feet of gas in sand at 3,291-3,314 feet.

Hughes County

Indian Territory Illuminating Oil Co.'s No. 1 Bruner, SW cor. SE, Section 17-8-10, made 183 bbls. from the Papoose sand at 3,180-3,200 feet after finding the Wilcox sand nonproductive at 4,149-72 feet.

Okmulgee County

Sunray Oil Corp.'s No. 1 Cooper, NE cor. NW, Section 36-16-13, is rigging up to deepen from 1,633 feet. T. H. McBrayer and others' machine is at the location for No. 2 Tucker, SW cor. NW, Section 9-15-14. O. D. Stansbury and others moved a machine out for No. 1 Harrison, SW cor. NW SE, Section 25-15-14. J. E. Wallace has a machine on the ground for No. 6 Colbert, CWL NW SE, Section 14-14-14. F. D. Misener's No. 4 Kershaw, SE cor. NW, Section 11-13-14, is spudding. Eagle Picher Lead Co. has the rig up for No. 1 Connor, SE cor. SW, Section 4-12-14, to be a Wilcox sand test.

White Eagle Oil & Refining Co. and others' No. 2 Bugg, NW cor. NE SE, Section 19-14-11, drilled to the Wilcox sand at 3,075-88 feet, then plugged back to the Dutcher sand at 2,477-2,503 feet and was abandoned. Carr Peterson's No. 4 Ware, NE cor. NW SW, Section 9-15-14, is shut in for 29,765,970 feet of gas in sand at 1,823-41 feet. Cassellman & Young's No. 1 Lewis, NE cor. NW NE, Section 36-15-14, is dry and abandoned at 672 feet. L. S. Richardson's No. 4 Barnett, C SW SW, Section 6-14-15, is dry and abandoned at 690 feet. John Aggas' No. 2 Smith, NW cor. NE NW NE, Section 20-12-14, has been abandoned at 890 feet. B. Morgan's No. 1 Fisher, NE cor. NW, Section 13-11-13, is a 25-bbl. well in sand at 3,319-30 feet.

Muskogee County

Star Development Co. has a machine at the location for No. 2 Morris, NE cor. SE, Section 20-15-15. H. E. Willims has a machine on the ground for No. 1 Daniel, SW cor. SE SW, Section 8-15-17.

Metzger & Fultz' No. 1 Townlot, SW cor. SE, Section 34-15-18, has been abandoned at 1,926 feet. Tennessee Six Oil Co.'s No. 7 Sango, SW cor. SE SE, Section 1-14-17, had an initial production of 12 bbls. in sand at 1,188-1,200 feet.

Garfield County

Reynolds & Son's No. 1 Smith, SE cor. SW, Section 23-22-4w, had sand at 1,910-37 feet, shot 40 quarts and made 10 bbls.

Garvin County

Magnolia Petroleum Co.'s No. 1 Ringer, NE cor. Section 15-1-3w, has been abandoned at 2,430 feet.

Major County

Henry Randou's No. 1 Parker, NE cor. NW, Section 4-23-16w, has been abandoned at 1,150 feet.

Pawnee County

Mowry and others' rig is on the ground for No. 1 Rogers, SW cor. NW, Section 15-21-7. Ora Steen made location for No. 1 Oliver, SW cor. NE, Section 5-20-7. Turner and others' No. 2 Smelzer, NW cor. SW SW NW, Section 29-20-9, is spudding.

Turner and others' No. 1 Smelzer, SW cor. NW, Section 29-20-9, made 7 bbls. after a shot of 25 quarts in the Layton sand at 1,082-1,120 feet. B. Swift's No. 1 Pounder, NW cor. SW NW, Section 33-20-9, was completed for 2,750,000 feet of gas in sand at 1,471-91 feet.

Pontotoc County

Jolly-Ogg Oil Co.'s No. 1 Lewis, SE cor. SW, Section 29-5-5, is making 130 bbls. from sand at 2,587-99 feet. Louisiana Oil Refining Co.'s No. 6 Harjo, NE cor. SW SW, Section 17-5-8, Allen Pool, made 307 bbls. from sand at 2,713-51 feet. W. R. Ramsey's No. 2 Patterson Harjo, SE cor. SW, Section 20-5-8, has been shut in for 40,000,000 feet of gas in sand at 2,598-2,624 feet.

Stephens County

Owen & Wood built the rig for No. 9 Massey, SW cor. SE NW, Section 12-2s-8w. Touhy and others' No. 2 Edwards, SW cor. SE SE, Section 3-3s-5w, is drilling at 180 feet.

Clark & Cowden's No. 1 School Land, SE cor. NW SE, Section 36-2-9w, is dry and abandoned at 2,004 feet. Magnolia Petroleum Co.'s No. 1 Funk, SW cor. NE NW, Section 30-1-8w, drilled to 2,307 feet, plugged back to 2,256 feet, and is making 5 bbls. Margay Oil Corp.'s No. 1 Karrahner, SE cor. NW, Section 7-1s-8w, has been abandoned at 2,847 feet. Clarkson & Smith's No. 1 Blaydes, SE cor. SW SE, Section 29-1s-8w, is dry and abandoned at 2,286 feet. No. 2 Blaydes, NE cor. SE SW SE, Section 29-1s-8w, a location, has been abandoned. Humble Oil & Refining Co.'s No. 1 Perkins, SE cor. SW SE, Section 12-1s-4w, made 225 bbls. from a series of sands at 2,465-3,001 feet. Schermerhorn Oil Co. and others' No. 1 Shields, NW cor. SE, Section 13-1s-4w, has been completed for 30,000,000 feet of gas in sands from 2,053 feet to 2,731 feet. Owen & Wood's No.

(Continued on Page 132)

OXFORD DISTRICT REACHES NEW HIGH; GAS TRANSFERS IN KANSAS FIELD

By J. L. Dwyer
Staff Correspondent, Kansas Fields

Cold weather has brought a scarcity of gas to many regions of Kansas, with the result that numerous territories have witnessed an extensive gas play. The north part of Sumner County is a spot which has been given this character of play by gas interests, the region around Conway Springs furnishing 4,000 acres of prospective oil lands which were the property of the Champlin Refining Co., of Enid, Okla. The gas rights under this land were sold to the Larutan Fuel Co. which supplies industrial and domestic gas to many cities of south Kansas. The Gypsy Oil Co. is reported to have made a similar deal with Harris & Haun, involving the gas rights under land on the Kansas-Oklahoma border.

The Oxford district of Sumner County registered a new high last week when it produced 29,067 bbls. The output of the Oxford Townsite Pool was 15,126 bbls. from 42 wells. The southwest extension of the Oxford Pool furnished a good well when Poling and others' No. 1 Wenrich, NE cor. NW, Section 23-32-2, made 1,800 bbls. after being shot twice, first with 100, and second with 20 quarts. The total depth of the well is 2,138½ feet. The top of the sand was 2,084 feet, and the well was flowing 400 bbls. from a depth of 2,095 feet. Deeper drilling and the second shot made the big production.

Cowley County

Small & Ash's No. 1 Bush, NE cor. NW SE, Section 3-30-4, is drilling at 465 feet. Roxana Petroleum Corp.'s No. 1 Beard, NE cor. Section 29-30-3, is dry and abandoned at 3,102 feet. Roth & Farout's No. 1 Moncreif, Lot 1, Block 26, Winfield Townsite, Section 22-32-4, gauged 1,000,000 feet of gas from sand at 2,525-35 feet.

Marion County

Sutter and others made location for No. 1 Townsite, SE cor. Section 15-17-4, Lost Springs Pool. Braden and others' rig is on the ground for No. 1 Smith, NE cor. Section 22-17-4. Lariaux and others made location for No. 1 Peterson, SW cor. NW NW, Section 23-17-4. Location for No. 2 Patterson was made, SE cor. NW NW, Section 23-17-4. The rig has been moved out for No. 1 School Lot, SW cor. NW NW NW, Section 23-17-4. Phillips Petroleum Co. has the rig material on the ground for No. 1 Peterson, NW cor. SW NW, Section 23-17-4.

Ellsworth County

Valerius & Cheney's No. 1 Meximer, C NW, Section 9-15-10w, is dry and abandoned at 3,503 feet.

Greenwood County

Empire Oil & Refining Co.'s No. 4 Schwab, SW cor. NE NE, Section 25-22-12, Lamont Pool, made 200 bbls. after a shot of 260 quarts in sand at 1,676-1,725 feet. McGinnis and others' No. 5 Green, SE cor. SW SW, Section 11-23-9, was shot with 100 quarts and made 75 bbls. from sand at 2,331-70 feet.

Seward County

Wilson & Moore's No. 2 Boles, SE cor. NW, Section 3-35-34w, has been completed in sand at 2,702-35 feet, making 3,000,000 feet of gas.

Sumner County

Champlin Oil & Refining Co.'s No. 2 Love, NE cor. NW SW, Section 9-30-2w, has been completed for 4,000,000 feet of gas in sand at 2,018-28 feet. Roxana Petroleum Corp.'s No. 5 Shore "B," NW cor. SW, Section 25-31-2, Churchill Pool, made 10 bbls. after shooting 100 quarts in sand at 1,846-1,900 feet. Davis & Hazlett's No. 1 Bussard, SE cor. Section 35-21-2, is dry and abandoned at 3,690 feet. Derby Oil Co.'s No. 1 Spence, Midland Valley Right of Way, Oxford Townsite Pool, Section 14-32-2, was completed for 376 bbls. in sand at 1,992-2,103 feet. Barnsdall Oil Co.'s No. 1 Wenrich, NE cor. NW, Section 23-32-2, flowed 400 bbls. from sand at 2,038-94 feet after a shot of 114 quarts.

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But they must be balanced.
This is ordinarily done by making them solid.

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New Dome in Iberville Possibility

Roxana Test in Sand Thought Richest There for Some Time. Orange Pool Well Deepened Makes 4,000 Bbls.

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Jan. 16.—Possibilities of new dome production in the Texas and Louisiana Coastal territory were indicated at the close of the week in Roxana Petroleum Corp.'s No. 1 Wilbert at White Castle in Iberville Parish, Louisiana. If this test makes a producer it will be one of the most important developments in this district in several months. Roxana Petroleum Corp. was connecting flow line and getting ready to set screen for testing the sand which it encountered at 1,580-89 feet in blue shale. The consensus of operators in this district is that the sand is the richest appearing seen here in some time. The 9⅝-inch casing is set in the hole at 1,578 feet.

White Castle is a probable salt dome discovered during the past year through geophysical operations of the Roxana Petroleum Corp., which holds the entire acreage. It is in the southwestern part of Iberville Parish. The test is the first drilled on the prospective dome and should it make a producer the dome will be one of the few on which production has been found without extensive drilling.

Indications are, however, that the oil will be heavy, as much of the oil produced on the Gulf Coast, and, with few exceptions, chiefly Jennings in Acadia Parish, South Louisiana dome fields have not been sensational in flush production.

Another new South Louisiana field was in the limelight as the week closed with Calcasieu Oil Co.'s No. 1 Olevia, East Hackberry, north central Cameron Parish, waiting to drill out the 6⅝-inch plug and drill into the sand from which East Hackberry's discovery well, Calcasieu Oil Co.'s No. 2 Caldwell, is producing at 3,971-96 feet.

No. 2 Caldwell was completed early in November flowing 1,000 bbls. daily of 22 gravity pipe line oil. The well, so far the only producer in the district, still is producing at the rate of 765 bbls. of oil daily. At this rate production has held up unusually well.

No. 1 Olevia will be drilled in early this week, according to the operators. The test, while operated by the Calcasieu Oil Co., is owned jointly with the Magnolia Petroleum Co. and the Union Sulphur Co., who also have another drilling test and a derrick up for another in that district.

Good Well at Orange

Completions the past week included a 4,000-bbl. well at Orange. This was a typical Gulf Coast producer, it being Sinclair Oil & Gas Co.'s No. 5 Granger, an old well deepened from around 3,400 feet to its present deeper sand at 3,960 feet.

Pierce Junction also figured with three good wells, one of which, Navarro Oil Co.'s No. 2-A Cain, blew in while being worked over flowing at the rate of 1,000 bbls. daily. This well was worked over and deepened last August from 4,000 to 4,875 feet and at that time came in for 2,400 bbls. daily.

Gulf Production Co. got a 1,000-bbl. flush producer (No. 22 Taylor) at Pierce Junction but this well since has declined to 15 bbls. hourly and will be worked on in an effort to restore its flow. The latter is flowing from 4,922 feet.

The Hull Field of Liberty County got a 500-bbl. producer; Goose Creek, Harris County, three fair wells; Blue Ridge, one; High Island, Chambers County, one, while two new wells were reported at Spindletop.

Orange Petroleum Co.'s No. 4 Merchant defined the south edge of Sour Lake, Hardin County, during the week when it encountered the salt and was abandoned at 4,851 feet. Six other tests were abandoned during the week, one being in Montgomery County. This was Brains and associates' No. 1 Fitch, 3 miles east of Spring and a rank wildcat.

At Blue Ridge, Fort Bend County, H. R. Cullen and associates' No. 1 Blakely, which came in 10 days ago as one of Blue Ridge's biggest wells, was killed this week and will be worked to increase its flow. The well came in flowing at the rate of more than 2,000 bbls. from a total depth of 3,873 feet.

Nash Dome Blowout

Rycade Oil Corp. had a blowout in its No. 18 Wisdom at Nash Dome, Fort Bend County, while coming out of the hole at 3,998 feet. Production was estimated at 30,000,000 feet of dry gas. The hole later bridged over killing the well. Rycade has drilled out the plug and Saturday was coring. Rycade has another gas well at Nash Dome, the No. 16 Wisdom which was completed for approximately 50,000,000 feet of gas. It is still making 20,000,000 feet.

Two other Nash Dome tests are nearing the interesting stage, these being Nos. 20 and 21 Wisdom. These are expected to pick up the producing sand before long and prove up that part of the dome field.

Pure Oil Co.'s No. 3 Sweet Lake at Sweet Lake still is producing at the rate of around 960 bbls. of oil after being opened 10 days ago. Daily average production previously had been between 380 and 400 bbls. daily since the well's successful working over late in December.

Production Declines

Daily average production in Gulf Coast fields as a whole declined 6,819 bbls., the total average during the week being only 119,496 bbls. as against 126,315 bbls. of the previous week. As can be noted in accompanying tables the decline at Spindletop was responsible again for the decrease, this field having reflected a sharp decline for several weeks.

Southwest Texas and Central Texas fields also declined in daily average production. The daily average by fields for the week ending January 14 was:

Spindletop	42,125
Saratoga	1,062
Batson	1,398
Goose Creek	6,974
Sour Lake	3,614
Hull	11,513
Big Creek	2,050
Columbia	8,538
Humble	3,416
Pierce Junction	9,229
Blue Ridge	4,570
Markham	200
Orange	4,073
Damon Mound	825
South Dayton	263
South Liberty	1,921
High Island	28
Moores Field	38
Boling	2,162
Nash Dome	1,143
Barbers Hill	500
Vinton	4,164
Starks	368
Edgerly	1,839
Evangeline	1,133
Lockport	4,705
Sweet Lake	960
Sulphur	6
Hackberry	765
Total this week	119,496
Total last week	126,315
Decrease	6,819

Southwest Texas

Somerset	2,247
Lyt.on Springs	1,515
Dale	379
Luling	14,780
Miscellaneous	8,210
Total this week	27,131
Total last week	27,170
Decrease	39

Central Texas

Mexia	8,317
Cedar Creek	1,000
Nigger Creek	1,176
Currie	531
Wortham	2,245
Richland	617
Powell	12,781
Total this week	26,661
Total last week	28,864
Decrease	2,203

Austin County

At Racoon Bend, Austin County, Humble Oil & Refining Co.'s No. 1 Stravoski is drilling blue shale at 1,113 feet. This company's No. 2 Gotosky is in sand and shale at 2,865 feet. Weedock and associates' No. 1 Ward, Austin County, is drilling around 350 feet.

Brazoria County

At Allen Dome, Brazoria County, Roxana Petroleum Corp.'s No. 1 Allen Bernard, Friday bailed 125 feet of salt water from the bottom of the hole and flowed 31 bbls. of oil from sand at 5,337 feet. Roxana has been working with this well for three weeks in an effort to make a consistent flowing producer. This company's No. 4 Allen on the same dome has casing set at 4,858 feet and is waiting on cement to set before drilling in. No. 1 Random is drilling in a medium hard sandy shale at 4,590 feet.

Roxana's No. 2 Bell at Clemens Dome, also in Brazoria County, is drilling sticky shale at 5,395 feet.

At "Slop Bowl," Brazoria County, Rucks and associates have abandoned their wildcat No. 1 Muldoon at 906 feet. This test has been shut down for some time. Starks and associates' No. 3 Hinckle, another Brazoria County wildcat, has been shut down at 1,760 feet.

Chambers County

The High Island Dome on the coast of Chambers County got a 75-bbl. well the past week in McLean Oil Co.'s No. 11 Cade. The well is flowing by heads from a sand around 3,385 feet. No. 10 Cade is drilling around 4,210 feet and No. 6-C Cade below 2,050 feet.

At Barbers Hill, R. L. Bartlett's No. 1 Fisher is drilling below 800 feet. Bennett Petroleum Co.'s No. 8 fee is being worked over.

Pure Oil Co.'s No. 1 Lost River at Lost Lake is drilling gumbo at 2,912 feet. Pure Oil has not started actual drilling yet on its other four locations at Lost Lake, but has derricks up and will begin operations in the near future.

Colorado County

B. A. Johnson has spudded in his No. 1 Breeding, a wildcat in Colorado County and Carl Milentz has a rig up for No. 1 Auerbach. Rich Oil Corp. is drilling around 750 feet in No. 1 Von Rosenburg fee.

Fort Bend County

The Blue Ridge Dome of Fort Bend County had only one completion during the week, this being Gulf Production Co.'s No. 13 West Schenck, which came in flowing at the rate of 100 bbls daily from sand at 3,812 feet. H. R. Cullen is getting ready to rig up on his two new tests, No. 1 Lafferty and No. 1 Davidson. He also has a location for No. 1 Luscher. Blakely and Means have a derrick for No. 1 Blakely. Cunningham Pro-

(Continued on Page 147)

ONE GOOD PRODUCER IN THE EAST WITH 160 BBLS. INITIAL PRODUCTION

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Jan. 16.—During the entire week of development work but one good producer was completed, the Empire Gas & Fuel Co.'s No. 6 on the Delpha Nethrow farm, in the deep sand territory in Section 16, Hardy Township, Holmes County, Ohio. The first 24 hours after it was drilled through and shot in the Clinton sand it produced 160 bbls.

In Section 12, Fallsbury Township, Licking County, Murphy & Co. completed a test on the Ira M. Cochran farm. It produced 65 bbls. the first 24 hours after shot in the Clinton sand.

In Section 16, Licking Township, Licking County, the A. H. Heisey Co. drilled a second test on the James Davis farm through all sands, including the Trenton Rock, to a total depth of 4,630 feet. It showed a little oil and was shot but did not improve and will probably be abandoned.

In the southwest quarter of Section 24, Salt Lick Township, Perry County, about 1 mile northwest of the Kachelmacher estate's test on the Hemlock Coal Co.'s property, Adair and others have completed in the Clinton sand a test on the Harry Thorpe farm. It is a duster.

In the northwest quarter of Section 16, Aurelius Township, Washington County, Isaac W. Atkinson has completed a test on his own farm. It is a very light pumper in the Marksburg 700-foot sand.

In Section 19, Reading Township, Perry County, the Hope Construction & Refining Co. has started to drill a test on the Samuel Brown farm. In the same section and township, the same company is drilling a second test on the Cyrus Barnes farm. In Section 21, Harrison Township, William Cline and others are drilling a test on the C. M. King farm. In Section 21, the Northern Oil Co. is drilling a test on its own property. In Section 23, the Orndoff estate is due in the Clinton sand on the Brick Clay & Products Co.'s property.

In Salisbury Township, Meigs County, the Coal Hollow Oil & Gas Co. has a gasser in the Macksburg 500-foot sand at No. 5 on the R. T. and R. N. Burdette farm. In Island Creek Township, Jefferson County, Blackburn & Co. have started to drill a test on the E. T. Cashier farm. In Section 21, Wayne Township, Belmont County, C. O. Moore & Co. have the rig completed for a second test on the Ross Carpenter farm. In Knox Township, Columbiana County, Renner & Deibel have started to drill on the Addison Blumer farm.

In the southeast quarter of Lot 15, Columbia Township, Lorain County, the Empire Gas & Fuel Co.'s test on the G. W. and M. B. Brooks farm is a light gasser.

Cuyahoga County

In the southeast quarter of Lot 32, Stormville Township, Cuyahoga County, the East Ohio Gas Co.'s test on the John Dorsey farm is a gasser in the Clinton sand good for 1,000,000 feet. In the same lot and township, Dillon & McFredricks have a gasser good for 900,000 feet. In the northeast quarter of Section 32, the

(Continued on Page 123)

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Carey ASBESTOS PIPE LINE FELT

Big Producer Starts Other Operations

Humble Stakes Locations for Additional Tests Following Action of Kingsville Field Well Which Flows 1,200 Bbls.

By B. D. Stevenson
Staff Correspondent, Southwest Texas

SAN ANTONIO, Tex., Jan. 16.—Two new locations by the Humble Oil & Refining Co. in the Kingsville Field, one a diagonal offset to the northeast of No. 2 Flato and the other a little over a quarter of a mile northeast, are the chief features in proven territory of an otherwise very quiet week. Most of the activity in Southwest Texas at this time is wildcat, the drilling in proven territory being negligible. In the Kingsville Field, No. 2 Flato, as previously reported, pumped 15 bbls. daily for two years and on December 23 started to flow and increased until it was making around 1,200 bbls. of oil a day. Humble is rigging up No. 5 Kleberg in the southwest corner of Lot 8, Section 40, and 150 feet from west and south lines, which is diagonally northeast of No. 2 Flato which is in the northeast corner of Lot 10, Section 40, and 150 feet from north and east lines. Humble has also made location for No. 6 Kleberg, 150 feet from the east line and 450 feet from the north line of Lot 1, Section 40, Lot 1 being next north of Lot 8.

No. 2 Flato is still flowing about the same volume. No. 6 Kleberg is a west offset to No. 4-A Dennett completed the past week at 2,270 feet as a 60-bbl. pumper. It is also a south offset to No. 1 Kleberg, which is a producing well at 2,275 feet. No. 6 Kleberg will probably stop at the 2,275-foot sand but No. 5, which is near No. 2 Flato, will probably go to around 2,928 feet, the total depth of No. 2 Flato in order to ascertain, if possible, from where the increased production is coming.

In the Laredo territory the past week there was only one small gas well of 4,000,000 feet completed by the Houston Oil Co., but development work seems to have been assured in the Driscoll Pool on the Driscoll ranch in Duval, where Robert Driscoll, a wealthy ranch owner of Corpus Christi recently completed a big gas well on land he owns in fee. It was No. 8 Driscoll. No. 9 Driscoll, which is 1,500 feet east of the No. 8, was down to 2,400 feet last Friday and No. 8, which was the discovery well, got the pay at 2,449 feet. No. 9 seems to be a little lower and it is thought has a chance for making an oil well. No. 10, which is 2,000 feet west of No. 8, was drilling at about 580 feet. Rock pressure in No. 8 is 950 pounds and it is thought good for 50,000,000 feet of dry gas.

One of the things that assures some development at once is the fact that Edward St. Albans has purchased 672.8 acres from Driscoll at $25 an acre with a drilling obligation. The land is described as the SW N half Section 25, and is a half mile northeast of the Driscoll wells.

Pipe line runs from the Humble and Reiter-Foster Pool in the west edge of Duval County and 12 miles north of the Cole gas field were 2,607 bbls. from two wells. The pool is the baby pool of the Mirando district. Humble is drilling another well there. The pool thus far has not shown up to do much but the wells may be edge wells. Humble has spudded No. 7 Kohler, near the two producers.

COMPLETIONS

Caldwell County

The Texas Company's No. 1 Osteen, W. C. Swearingen Survey, Dale Field, at 2,334 feet, approximately 40-bbl. well; No. 2 Osteen, same survey and field, at 2,206 feet, flowed initial production of 130 bbls.; No. 5 Lackey, Jasper Gilbert Survey, same field, at 2,156 feet, is 30-bbl. pumper.

E. F. Smith's No. 5 San Marcos, a location in Caldwell County, has been abandoned.

Martin & Wright's No. 1 Mat Blackwell, 1 mile from Burdette Wells, has been abandoned at 26 feet, as leases were lost.

Alexander-Lyles & Adams' No. 1 McConnell, William Spillars Survey, has been abandoned as dry at 2,506 feet.

Kleberg County

Humble Oil & Refining Co.'s No. 4-A Dennett, Lot 1, Section 39, Kingsville Field, at 2,270 feet, is pumping 60 bbls.

Kinney County

W. A. Stephens and others' No. 1 Jim Clamp, Section 346, has been abandoned at 1,070 feet.

Jim Hogg County

Magnolia Petroleum Co.'s No. 32 Merchants State Bank, Survey 415, Randado Field, has been abandoned at 2,885 feet as dry.

Magnolia Petroleum Co.'s No. 17-A Martinez, Survey 256, Henne-Winch & Fariss Field, has been abandoned at 2,200 feet when pipe froze.

Maverick County

Rycade Oil Co.'s No. 2 Sullivan at 5,510 feet has been abandoned dry.

Val Verde County

Independent Operators' No. 1 White-

(Continued on Page 96)

WILDCATS IN DUVAL AND CALDWELL COUNTIES HAVE PROMISING SHOWS

By B. D. Stevenson

SAN ANTONIO, Tex., Jan. 16.—Magnolia Petroleum Co. has abandoned at 2,885 feet its No. 32 Merchants State Bank in Jim Hogg County in Survey 415 at the south end of the Randado Pool. Production in the pool is had at 1,350 feet. The Magnolia has drilled a few wells around the field trying to find bigger production and No. 32 Merchants State Bank, 850 feet from the west line and 2,100 feet from the north line was equivalent to a wildcat test for deeper sands.

In the Laredo district Milo E. Trussell, trustee, and others' No. 1 Moody in Survey 60, in the northwestern part of Duval County, after testing about 500 feet of oil in the drill stem, set casing and is at this time getting ready to test again. Total depth is 2,429 feet and the well seems to have a better chance to make a producer than the first wells drilled. It is the most interesting wildcat in the entire Mirando territory at this time.

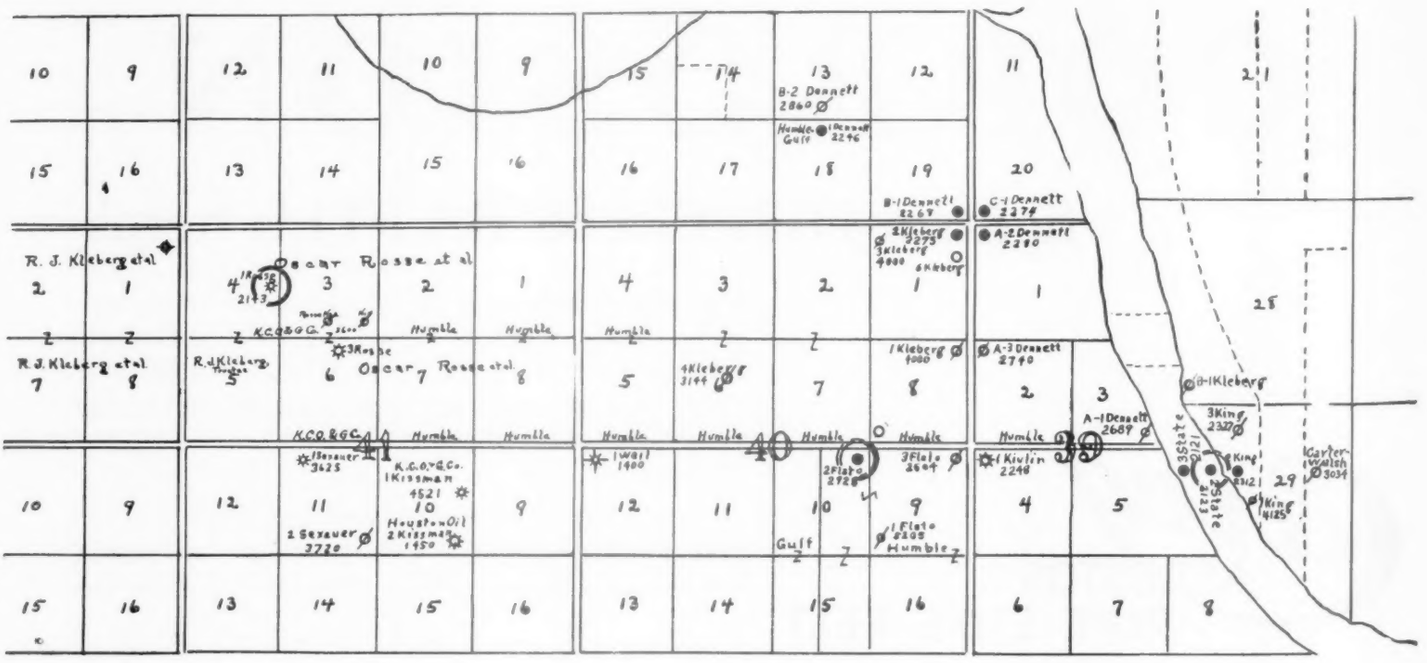
In Zavala County, J. G. Pundt's No. 1 West tested at 1,312 feet and got about 100,000 feet of gas. It came in making less but has been building up a little and it is understood will be allowed to stand and the gas used to fire the boiler for another test, with the hope that use of the gas will cause it to increase. It is in wildcat territory many miles from production but in a section where gas in considerable volume has been encountered before.

J. E. Walsh is starting two important wildcats, one in southwestern Bexar County which will be known as the Larsen-Walsh's No. 1 Oppenheimer and the other in Medina County which is Morgan-Walsh's No. 1 L. A. Haby in Survey 50½, a few miles southwest of Dunlay. Both tests are in territory where major companies have worked out structures and each is on a Dixie Oil Co. block of leases. Each will be an Edwards lime test and each has spudded in.

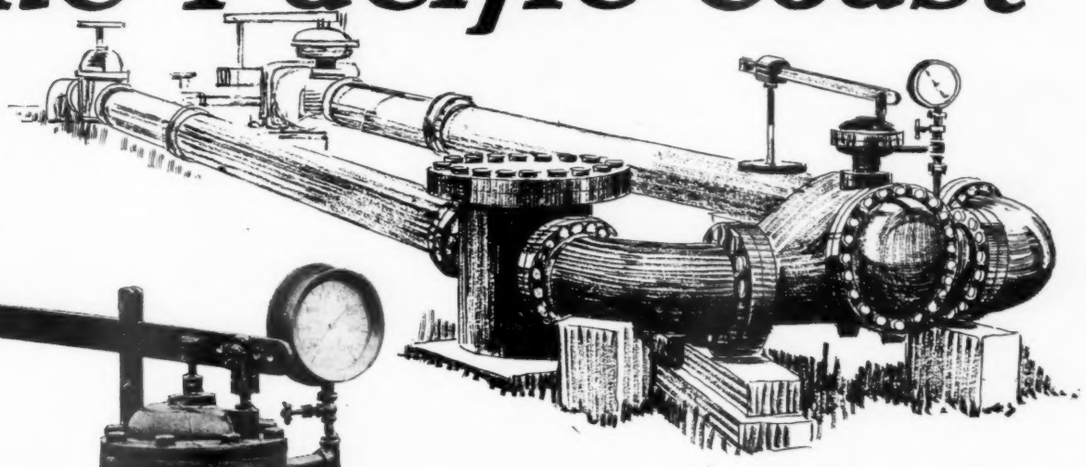
C. W. Bates last week spudded in the first test for oil ever drilled in Blanco County. It is No. 1 Hermann Massey, 8 miles east of Blanco City and, being on the north side of the Balcones fault, the Pennsylvanian is expected to be topped at about 1,800 to 1,900 feet. Two other tests are to start in this virgin county within a short time and one, the Rodson No. 1 Glasscock is now rigging up.

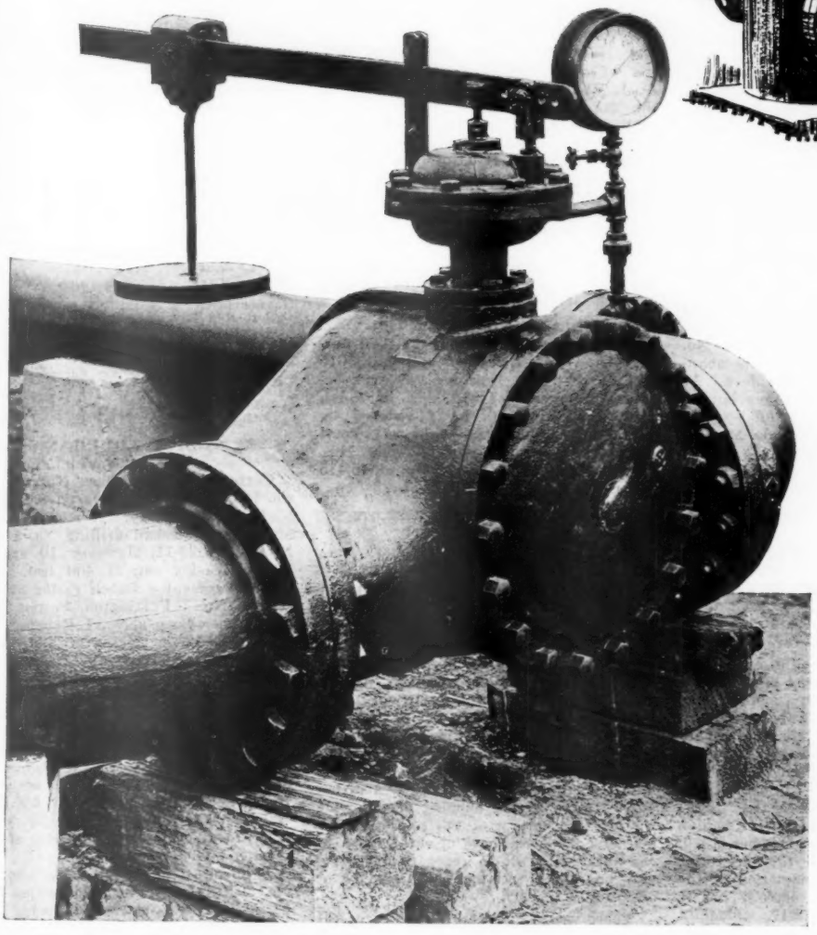
Dickinson & Smith's No. 1 Callahan in Caldwell County, a little east of the North & South's No. 1 Callahan, has topped the chalk at 1,905 feet and is now

(Continued on Page 100)



EMCO Regulators on the Pacific Coast





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Pine Island Trinity Area Extended

Two Completions Add 110 Bbls. to Production. Champagnolle Well Makes 4,000 Bbls. Fluid Two Days and Then Goes Dead

By D. H. Bancroft
Staff Correspondent, North Louisiana-Arkansas

SHREVEPORT, La., Jan. 16.—Production in territory south of Section 14-21-15, to which development of the 3,900-foot sand in the Pine Island Trinity area seemed to have been confined until last week, was added to during the week just closed by The Texas Company's No. 50 Caddo Mineral Lands in the NW cor. of Section 23-21-15, which was put on the air for 50 bbls., total depth 3,910 feet. The same company's No. 51 on the same lease, a 50-bbl. pumper, total depth 3,942 feet was one of the two extension wells last week, the other being Dixie Oil Co.'s No. 9 Caddo Mineral Lands in the NE NW, Section 23, pumping 60 bbls., total depth 3,909 feet. One of three tests drilling below 4,000 feet in this area was abandoned as a junked hole, Palmer Corp. being unable to get hold of 100 joints of 4½-inch casing lost while setting at 4,395 feet in No. 1 Sellington, Section 17-21-14. Since leaving the upper levels of the Trinity it had made but one test, dry at 3,694 feet.

Woodley Petroleum Co. made a rather interesting test in the Trinity in one of its old Cotton Valley wells. No. 1-B Cox, completed last October 15 as a 4,000,000-foot gasser at 4,438 feet, was deepened 300 feet to 4,737 feet where it came in again with about the same amount of gas but with lots of salt water and quite a bit of high gravity oil. Three sands were passed through in the 300 feet of new hole and it is believed the water is coming from one of these. At any rate, 4½-inch casing probably will be set to cut off the water for another test for the oil which one account describes as looking very much like a mixture of crude oil and gasoline.

Champagnolle Well Dead

Champagnolle, in Union County, Arkansas, listed its biggest completion to date but the well, Ohio Oil Co.'s No. 7 Crain in the NW cor. NW SW, Section 1-17-14, did not last long. Completed January 6 flowing an estimated 4,000 bbls. of fluid, 40 per cent water from 3 feet of sand at 3,029-32 feet, it flowed at that rate for two days and suddenly went dead. Two days later the company's No. 2 Rich Pumphrey in the NW cor. SE SE, Section 2-17-14, a quarter mile southwest, came in with an estimated 4,000,000 feet of gas in 4 feet of sand at 3,010-14 feet adding to the uncertainties of this contradictory pool. Meanwhile Keen & Woolf & Root refineries' No. 1 Gregory in Section 10-17-14, which was completed December 30 pumping 50 bbls. oil and 450 bbls. salt water from 4 feet of sand 2,761-65 feet and six days later started flowing 2,500 bbls. of fluid, 45 per cent water with 1,000,000 to 2,000,000 feet of gas, has dropped down to about 1,000 bbls. of fluid with the same quantity of oil and gas.

Eddy Jones will make a 3,500 to 4,000-foot test, possibly deeper, of No. 3 Crain in the NW cor. NE SE, Section 2-17-14, a quarter mile north of the Ohio's gasser. Jones' well tested salt water with no oil or gas in 5 feet of sand 3,071-76 feet and is drilling red gummy shale at 3,275 feet.

Uneventful Week

Beyond these wells it was a rather uneventful week in proven areas of the Shreveport territory. Twenty completions added five producers with an initial production of 2,535 bbls. but one of these went dead soon after completion leaving a net of four producers with 135 bbls., all in Caddo Parish. Nine gassers in Caddo, Richland, East Texas and Champagnolle had an initial open flow capacity of 78,432,000 feet and there were six failures.

Caddo had eight completions. Belchic & Laskey abandoned their wildcat in the Greenwood district, No. 1 Boynton & Crook, Section 11-18-16, as a dry hole in the shallow sand at 925 feet. Bussa & McGoldrick's No. 7 J. D. Bickham, a shallow well in Pine Island in Section 23-21-15, is pumping 5 bbls. oil, total depth 1,604 feet. It had been waiting for standard rig since last November. Ferguson and others completed No. 3 Abney, Section 7-17-16, in the Greenwood gas field as a 5,000,000-foot well, total depth 972 feet. Palmer Corp.'s No. 1 Sellington, Section 17-21-15, 3 miles east of Trinity development, is a junked hole at 4,395 feet. Rogers & Jenson's No. 1 Newton Smith, on a small "high" in Section 22-20-15, was dry and abandoned at 2,247 feet. Shreveport Oil Corp. abandoned location for No. 1 State, Section 28-21-15, on which it had derrick up but not rigged for a year. Standard Oil Co.'s No. 16 Hart in Section 34-21-16, is pumping 80 bbls., total depth 1,839 feet but No. 191 Stiles, Section 27-21-16, was abandoned as a dry hole at 1,904 feet. At 1,806 feet it showed a little gas but on second test showed neither oil or gas. The Texas Co.'s No. 50 Caddo Mineral Lands in Section 23-21-15, is making 50 bbls. of oil blowing with air from 3,910 feet. Waterman Brick & Tile Co.'s No. 1 Waterman in Section 18-17-16, Greenwood district, gauged 300,000 feet of gas, total depth 2,340 feet. Woodley Petroleum Co.'s No. 5-B Knight, Section 39-15-12, in the Caspiana Field, in the SE cor. of Caddo Parish, was completed at 1,921 feet with an estimated 5,000,000 feet of gas.

Richland Parish had one completion. Southern Carbon Co.'s No. 1 Sartor in Section 20-18-8, gauging 49,132,000 feet, total depth 2,448 feet.

Two completions each were listed in Harrison and Panola Counties, Texas. State Line Oil & Gas Co. completed No. 3 Z. Abney in the W. R. Anderson Survey, Harrison County, with 2,000,000 feet of gas, total depth 962 feet, and A. L. Waller's No. 4 J. M. Bryson in the same survey, made 5,000,000 feet, total depth 1,933 feet. In Panola County, S. H. Gardner completed No. 2 Roquemore in the B. C. Jordan Survey, as a 5,000,000-foot gasser, total depth 1,062 feet, and D. Thomason's No. 2 Crenshaw in the John Womack Survey, made 3,000,000 feet, total depth 2,350 feet.

Arkansas' completions were the Ohio Oil Co.'s No. 7 Crain and No. 2 Rich Pumphrey referred to.

Slight Gain in Production

Daily average runs from the field during the week showed a small gain, 615 bbl's., over the average for the week before, an increase of 810 bbls. in North Louisiana shipments being reduced by a decline of 195 bbls. in Arkansas. Total daily average runs were 135,360 bbls. of which Louisiana pools shipped 45,415 bbls. and Arkansas 89,945 bbls.

Smackover heavy oil dropped 395 bbls. to a new low level but there was an increase of 260 bbls. in the daily movement of the lighter grade. El Dorado dropped 210 bbls. and Lisbon 135 bbls., but there was an increase of 250 bbls. in oil run from the new Champagnolle Pool by Magnolia Pipe Line Co. and Nevada County had a small gain of 35 bbls. Stephens and Bradley were stationary.

In Louisiana, Caddo light oil increased 730 bbls.; Caddo heavy, 60; Homer, 55; Elm Grove, 110; Urania, 120. Haynesville shipments were off 85 bbls. per day, DeSoto-Red River, 70; Cotton Valley, 80, and Pleasant Hill, 30. Daily average runs from the field for the several pools were the following:

Arkansas	
El Dorado	5,200
Smackover, light	8,740
Smackover, heavy	68,660
Stephens	1,150
Nevada County	2,950
Lisbon	2,400
Bradley	100
Champagnolle	730
Total	89,945
Louisiana	
Caddo, light	11,770
Caddo, heavy	3,980
Homer	4,415
Haynesville	6,235
DeSoto-Red River	4,170
Elm Grove	635
Bellevue	1,060
Cotton Valley	4,510
Urania	7,740
Pleasant Hill	810
Total	45,415
Both states	135,360

NORTH LOUISIANA

Bossier Parish

Cartersville—Arkansas Natural Gas Co. is coring No. 1 Barnett, Section 17-23-12, at 3,102 feet. Northwest Louisiana Gas Co. began drilling No. 1 Bain, Section 31,23-11, January 10 and has 10-inch casing set at 400 feet. J. J. O'Brien cemented 6-inch casing at 3,088 feet in No. 1 Farrington, Section 21-23-12, Palmer Corp.'s No. 1 Roberson, Section 26-23-12, is rigging up and Sales & Walker have derrick up for No. 1 Kilgore, 200 feet north and 325 feet SE cor. NW NE Section 31-23-11. The Texas Company is rigging up to drill No. 1 Peyton, Section 30-23-11, and No. 2 Wilkerson, Section 36-23-12, is rigged up ready to drill. Woodley & Collins have derrick pattern on location for No. 1 Bain, Section 31-23-12, and for No. 1 Bollinger, Section 36-32-12. No. 3 L. & A. in Section 15-32-12, is coring at 3,235 feet.

Bellevue—Humble Oil & Refining Co.'s No. 30 Bliss & Wetherbee, Section 15-19-11, is in hard sand at 4,806 feet.

Elm Grove and Sligo—Clifton Davis' No. 5 Simpson, Section 14-16-12, is drilling at 1,070 feet. Ellis & Markley have made location for No 1 Hunter, 600 feet north and 900 west SE cor. Section 14-16-12. H. S. Goodwin's No. 1 Mercer, Section 21-16-12, has 6-inch casing cemented at 823 feet, and J. S. McCullough has set 6-inch at 1,530 feet in No. 5 Hodges, Section 25-16-12.

Caddo Parish

Greenwood—Belchic & Laskey began drilling No. 1 Croom, Section 10-18-16, January 9, and have 10-inch casing set at 100 feet. Magnolia Petroluem Co. is arranging to deepen No. 1 J. W. Furrh, Section 18-18-16, which has been standing temporarily abandoned since November 24 at 1,998 feet. It blew out some time before that date with gas and considerable salt water at 1,695 feet. No. 1 John Furrh in Section 32-18-16 is fishing for drill stem, total depth 2,755 feet.

Pine Island—Arkansas Natural Gas Co. is whipstocking No. 1 C. W. La...

(Continued on Page 151)

MISSISSIPPI TEST AGAIN DRILLING; TESTING RICHLAND PARISH FOR OIL

By D. H. Bancroft

SHREVEPORT, La., Jan. 16.—One more rank wildcat that has been carried on field reports for many months was dropped from the records this week when McClintock & Goodka's No. 1 Olga in Section 35-13-5, Drew County, Arkansas, was listed as rig moved and abandoned, total depth 2,880 feet. It had been standing shut down at that depth after resetting 4½-inch casing at 2,550 feet following a salt water test since October, 1926. Of greater interest than this, however, was the other wildcat completion of the week, H. M. Harrell, trustee's, No. 1 Ponder in Section 18-12-17, Ouachita County, 10 miles northwest of Camden. The well is the latest of a series Harrell has drilled in that vicinity during the past two or three years and was abandoned at 1,838 feet on account of salt water. Some of his previous completions were at the same approximate level while others were both shallower and deeper. Beyond showings that were just enough to warrant further prospecting, none of them produced results.

In Clark County, McKenzie Oil Co. cemented 8-inch casing to test 1 foot of sand at 644-45 feet and bailed fresh water with no show of oil or gas in No. 1 Eakin, Section 9-11-19, and has shut down for orders. The same experience has been had by other wildcatters operating in that part of the country, this water sand apparently covering a wide area.

Deepen Richland Extension

The only other development of particular interest in wildcat territory during the week came from Richland Parish where two wells attracted notice. Gulf Refining Co. is going deeper with No. 1 Millsaps in Section 8-17-6, which proved up territory 3 miles north of nearest production in the new gas field. The well blew in from 2,428 feet a week ago while the crew was coming out with drill stem to change bits and caught fire but after burning about 24 hours bridged and killed itself, saving the company a rather difficult job as the burning gas blowing against the bottom of the rotary fanned out and made the base of the flames exceedingly difficult to reach in trying to put out the fire either by steaming or shooting.

There was a question, in the event the fire should be put out, whether the well would be deepened in as much as the Gulf company having sold its gas rights to the Palmer Corp., the latter would have something to say as to this program. But the blowout, estimated to have been 6,000,000 to 10,000,000 feet, having demonstrated the presence of commercial gas that far from production furnished the desired information and the two interests agreed on its being deepened in search of oil.

In the other end of the field, developments of another sort were furnished by Moody & Seagraves' No. 1 Osborn in Section 14-15-5. Bailed dry with no show at 2,474 feet this semiwildcat has apparently missed the gas strata or is on another structure, and is drilling deeper in search of oil which, in the opinion of some of those who have been keeping up with it, it has about as favorable a chance as any of finding. Thus, while Richland is keeping up its gait of developing a reserve for the projected natural gas pipe

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Oregon Basin Well Flows by Heads

Third Test on Hospah Dome. Preliminary Contract for Purchase of New York Oil Co. Royalty Interests in Salt Creek

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Jan. 14.—Preliminary contracts for the purchase of the New York Oil Co.'s royalty interests in the Salt Creek Field in Wyoming by companies affiliated with the Midwest Refining Co. have been signed, but transfer of properties will not take place for three months during which time certain requirements are to be met before deal is completed. The Cody Petroleum Co.'s well on the Oregon Basin Dome in Park County, Wyoming, commenced flowing by heads from the top of the Embar sand at 3,553 feet while 6¼-inch pipe was being run preliminary to drilling into the sand. The Wyoming Oil Fields Co. had a 1-bbl. Lakota sand completion in Salt Creek and the Wyoming Associated had a 30-bbl. well in the Wall Creek. Drilling in the LaBarge Field has slowed down to a few wells during the winter, and wildcat operations over the state are at a low ebb.

In Colorado a small showing of oil at 3,650 feet in the Platte Valley Petroleum Co.'s wildcat on the Greasewood structure in Weld County, attracted some attention, and the Texas Production Co.'s Sundance sand well on the Moffat Dome pumped 136 bbls. first 24 hours, oil from the Morrison above ceasing to flow with this result. Another Sundance sand test in the western part of Moffat County on the Elk Springs Dome is scheduled to start soon. The Moody Oil Corp.'s test on the Glade structure in Dolores County, is not yet in the horizon that was the objective of the drill. Large payments for patents on shale lands in western Colorado were made by several claim owners and a 100-bbl. well was completed in the south extension of the Florence Pool.

In New Mexico, the Texas Production Co.'s No. 2 Robinson, in Eddy County, showed more oil upon being deepened and flowed 145 bbls. by heads in 24 hours. Skelly Oil Co'.s No. 1 Beulah Lynch, in Eddy County, has been completed as a 60-bbl. well. Producers & Refiners Corp. has decided to put down its third test on the Hospah Dome in McKinley County, and the Marland Oil Co. is getting started on its Lea County test.

Wyoming

Progress towards acquisition of the holdings in Salt Creek of the New York Oil Co., by interests identified with the Midwest Refining Co. was made the past week but it is not expected that any actual transfer of properties or leases will take place for three months. Contracts between the companies were signed in Chicago whereby, if certain conditions are met, the Midwest Oil Co. and the Wyoming Associated Oil Co. will each acquire substantial properties from the New York company. If the requirements are not met it is understood the Midwest interests will not be under any obligations to proceed farther with the deal. The nature of these requirements has not been disclosed, but it is understood that the three-months' period which will elapse before any transfer is made was agreed upon for the purpose of arranging these matters. It is presumed the delivery of titles acceptable to the purchasing companies is one of the requirements. Last June at the annual meeting of the New York company it was disclosed that there were two factions in the organization and it is said that in former negotiations differences prevented an agreement being reached. The Midwest Oil Co. is a subsidiary of the Salt Creek Producers Association, and the Wyoming Associated is a subsidiary of Mountain Producers. The last annual report of the New York Oil Co. disclosed that in 1926 an adjustment of its interests in Salt Creek was made with companies affiliated with the Midwest. It had a 6 per cent royalty interest in 1,920 acres which carried an obligation to sell the oil at 50 cents per barrel. The adjustment provided that the New York company would receive 4¼ per cent on the 1,920 acres, the price of oil to be on a sliding scale on the basis of prices of gasoline and kerosene, and in addition, was to receive 4¼ per cent on an additional 800 acres on the top of the structure. This agreement was to run until 1933 when settlements are to be made on current crude prices. At the end of 1926 there were 633 wells on the lands in which the company had an interest.

In addition to its oil holdings the company serves natural gas to Riverton, Lander, Rock Springs, Glenrock and Casper and several smaller communities, besides furnishing gas for fuel to the Standard and Midwest, The Texas Company and White Eagle refineries at Casper, operating an extensive pipe line system. Reports are to the effect that the company will retain its pipe line properties and gas franchises and continue as a public utility, selling its oil properties outside of Salt Creek to the Empire State Oil Co., an affiliated concern.

Flowing by Heads

The Cody Petroleum Co.'s No. 1 Ferdig, NE SE NE, Section 7-51-100, on the Oregon Basin Dome in Park County, which last week was reported topping the Embar sand at 3,553 feet, has not yet been drilled in. When the hole commenced filling with oil it was decided to shut down until the 6¼-inch casing could be run and connections made with tanks. Latest reports from the field are that the well commenced flowing by heads while trying to run the pipe, but no estimates were made as to the quantity. The well is approximately half a mile to the west of the Ohio Oil Co.'s No. 3 Sonners, the discovery well in the Embar-Tensleep series. In some respects the Ferdig well is showing up as good at this stage of operations as the other well, though it will have to be drilled considerably deeper before any comparisons can be properly made.

Another well which is getting close to the objective is the Ohio Oil Co.'s No. 4 Sonners, Section 8-51-100, the same section upon which the discovery well is located. This well, which was an old gas producer in the upper horizons, resumed operations two weeks ago to deepen from 2,260 feet. Rotary equipment was installed and drilling now is in progress below 3,000 feet. Charles E. Orchard's No. 1 Rue, SW SW, Section 28-51-100, on the south dome, is drilling below 2,690 feet and the formation appears to be changing at this depth. The Continental Oil Co.'s No. 1-A State, Section 16-51-101, is drilling at 2,140 feet and making good progress after getting away on a bad start, the hole going crooked twice. Producers & Refiners Corp.'s No. 1 Frisby, Section 32-52-100, set the 15½-inch casing 690 feet and is waiting for the cement to set. Cody Petroleum Co.'s No. 2 Klindt, Section 7-51-100, is drilling below 900 feet. Ferdig-Wyoming Oil Co.'s No. 2 Hough, SE Section 19-51-100, is fishing at 2,524 feet. Linco Oil Co.'s No. 1 Rosseau, NW Section 33-51-100, is underreaming the 10-inch at 1,825 feet, with total depth of 2,100 feet. Ohio Oil Co.'s No. 1 Batson, Section 6-50-100, is drilling at 2,465 feet. Other tests show no progress of importance since last week, most of them being temporarily shut down.

Salt Creek Completions

In Salt Creek, two completions were reported for the week, these being the first for several weeks. The Wyoming Oil Fields Co.'s No. 19-L, NW Section 25-40-79, was completed in the Lakota sand at 2,560 feet and made only 1 bbl. on the pump. It probably will be deepened. The Wyoming Associated Oil Co.'s No. 30, SE Section 35-40-79, a Wall Creek sand well, was completed at 1,305 feet with an initial production of 30 bbls.

In the LaBarge district in Sublet County there is comparatively little drilling under way following the completion of the 30-days' production test and it is not likely operations will be resumed on an extensive scale until spring. Now that the field has developed sufficient production to warrant the construction of a pipe line, there will be no need to rush the completion of wells in the winter months. The California Petroleum Corp.'s No. 25-F, Section 34-27-113, the company's last remaining drilling well, was stopped this week when the rig burned down. It will not be rebuilt for the present. The Akin Butte Oil Co.'s No. 1, SW, Section 22-27-113, is bottomed at 1,360 feet and trying to free the 6¼-inch. Joe Minton's No. 1, Section 34-27-113, is drilling at 1,000 feet.

On the edge of the town of Evanston, the Uinta Oil & Development Co.'s No. 1 Kastor, Section 21-15-120, is reported to have cut a sand at 1,300 feet showing some gas and enough oil to bail a few barrels before drilling deeper. At 1,219 feet, it had shut off a flow of water and had found a thin sand below that horizon which showed several bailersful of light amber colored oil of a very high lubricating stock.

Fremont County

On the Alkali Butte structure in Fremont County the Texas Production Co.'s No. 1, Section 1-33-95, is bottomed in blue shale at 1,531 feet and is temporarily shut down repairing engine. Producers & Refiners' No. 1 Hudson, Section 19-2-2, in the Lander Field, an old producer deepened, has been completed and tested. While the results have not yet been received it is said to be one of the best wells so far completed in the third sand.

The Producers & Refiners' No. 19, Section 25-26-87, on the Ferris Dome, in Carbon County, is drilling in the red beds at 3,520 feet. This is to be a deep test and the 15½-inch casing was set below 2,300 feet, probably being the longest string of that size ever run in Wyoming.

On the Ant Hills anticline in Niobrara County, the Buck Creek Oil Co.'s No. 1 Delahoyde, Section 25-37-63, is drilling again at 4,102 feet. This test showed for 250 bbls. from a sand at 3,946-52 feet, and ran into a water sand about 100 feet below that horizon. The water sand has been cased off and the test is continuing. The company has one other test drilling on this structure and rig for a third. This company's No. 1 Schuricht, Section 5-35-65, in the Lance

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CANADA'S PRODUCTION DURING 1927 APPROXIMATED 500,000 BARRELS

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Jan. 14.—Incomplete returns indicate that Canada's crude oil production for 1927 will reach an approximate total of 500,000 bbls. This is the highest figure since the years 1905 to 1908, when the short-lived Tilbury Field in Ontario was at its peak.

The greater part of the 1928 production comes from the Turner Valley Field in southern Alberta. With December figures estimated, the Alberta output for the year is set at 330,000 bbls. Eastern Canada's production is estimated at 170,000 bbls., this estimate being based on official figures for the first six months of the year, which showed a production for the Ontario fields of 69,177 bbls. and for New Brunswick of 15,590 bbls. The Ontario production is declining steadily; but in recent years the small production from the New Brunswick fields has shown a decided increase, the production for 1926 in that area being only 10,544 bbls., or approximately 5,000 bbls. less than the production for merely the first six months of 1927. In 1925 New Brunswick produced only 5,376 bbls.

The Alberta production for 1927 includes approximately 288,500 bbls. of casinghead gasoline or crude naphtha; 36,950 bbls. of light crude oil, and 3,817 bbls. of heavy crude, a total of 329,817 bbls. The crude naphtha and light crude oil are from the Turner Valley Field, and the heavy crude from the Wainwright Field, with a little bailing production from the Skiff Field. The value of the Alberta production is estimated at $1,253,242.

Alberta production in 1926 amounted to 217,088 bbls., while the production for all Canada in the same year amounted to 364,603 bbls.; so that of the 1926 production some 147,515 bbls. came from eastern Canada. Increase in the Alberta production over 1926 approximates 112,000 bbls.

Turner Valley Production

A recent summary of the Turner Valley producing wells shows the following production figures for individual wells (in barrels):

Crude Naphtha	
Royalite Nos. 1 and 2	8
McLeod No. 2	40
Illinois-Alberta No. 1	107
Vulcan No. 1	110
Royalite No. 4	600
Home Oil Co. (estimate)	60
Royalite No. 7	90
Total crude naphtha	1,015
Light Crude Oil	
McLeod No. 3	32
New McDougall-Segur No. 1	40
New McDougall-Segur No. 2	50
Dalhousie No. 5	50
Home No. 1	40
Total light crude oil	212
Total naphtha and light crude oil	1,227

The figures for the Royalite No. 4 represent an average for the year. In December Royalite No. 4, LSD 12, Section 7-20-2w5, broke all previous production records with a crude naphtha production for the month of 20,338 bbls., an average

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New Deep Sand Reported at Seal Beach

Two Additional Fields Discovered in California. Shell Gets 3,750-Bbl. Well From 7,015 Feet. Wildcatters Active

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Jan. 14.—California has just closed a very active week replete with interesting developments, the most important of which were the discovery of two new oil fields, the completion of a big flowing well in the Ventura Avenue Field at 7,015 feet and the possibility of greatly increased production in the Seal Beach Field due to the discovery of a new deep sand picked up a few weeks ago. This new deep sand found at Seal Beach is of paramount importance and while no official announcement has been made of a new discovery or its existence admitted it looks like a tip too hot to touch as Seal Beach and Long Beach may kick off the lid during the next several months and it might be another case of every man for himself with the sky as a possible limit. I cannot lay too much stress upon the possibilities of this new find at Seal Beach, especially in view of the fact that over half of the wells in the Alamitos Heights town lot area are in a stagnant condition and therefore susceptible to deepening operations within a relatively short time.

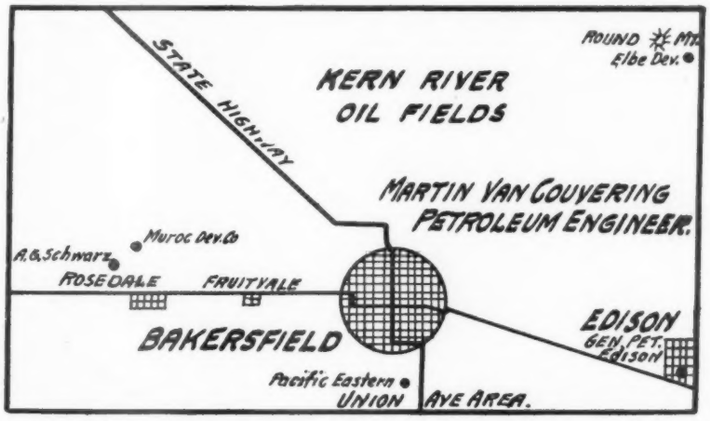
The Marland and Richfield have both picked up the new sand which lies below the 6,000-foot level and from confidential sources it has been learned that approximately 500 feet of highly saturated sand has been encountered. Neither the Marland nor Richfield will confirm the presence of this new sand but in view of the fact that both have clamped down the lid on the status of their respective projects the reader can form his own opinion. The most important development and one which tends to confirm this new find is the fact that the Marland has just taken four additional Selover zone wells off production for immediate deepening. No. 1 Bonner of the Richfield in the Alamitos Heights town lot area and Nos. 11 and 16 in the extreme northern part of the Selover lease of the Marland are all below the 6,000-foot level and an early test may be anticipated. The Marland is not doing any exploration work in the older section of the Seal Beach Field, both Nos. 11, 16 and the other four wells just killed for deepening being town lot offsets in the northern part of this lease.

Deeper Horizons a Menace

I am frankly worried over this new deep find as there is a possibility that the daily production of the Seal Beach Field may go up another 50,000 bbls. within the next several months and this, coupled with the fact that deep sand drilling at Long Beach is also scheduled to register substantial gains early this year, may result in a very unsettled and precarious condition. Seacliff may also be expected to contribute its share to California's 1928 production and this field, Ventura Avenue and several very promising wildcat areas, included in which are Fruitvale and Union Avenue, almost preclude any possible improvement in the local situation. There is no visible move in the older section of the Seal Beach Field to indicate that this new possible deep-drilling campaign in the northern part of the field may affect the holdings of the Marland, Associated and Standard but if the Marland starts producing from the newly discovered deep zone in the northern part of its Selover lease, as it must do to protect its acreage from drainage, the Standard and Associated may feel that they, too, are entitled to make a bid for some of this flush production. There have been deep rumblings for some time that the big three in the old section could not reach any equitable agreement to hold off work but I am rather inclined to believe that there will not be any aggressive drilling in this section unless the issue is forced by greatly increased drilling in the town lot area.

Two New Fields Opened

For the second time in less than six months California wildcatters have opened up two new fields in widely separated areas within a few weeks of each other. California's latest two new fields, the Edison district, a few miles southeast of Bakersfield in Kern County, and the Edna area, something like 8 miles southeast of San Luis Obispo, were opened up almost simultaneously during the early part of the current week. The General Petroleum was responsible for the discovery of oil at Edison as that company's No. 1 Kerwin was finished during the early part of the past week as a 125-bbl. pumper from the 3,981-foot level. This hole had previously been carried down to 4,006 feet but a 25-foot plug was put on bottom in an effort to shut out bottom water. There is some doubt as to whether this plug has proven effective as the output which tests 15.9 degrees is still cutting about 40 per cent. The new possible field near Edna in San Luis Obispo County was opened up by the Elberta Midway when that company's wildcat was brought in doing 225 bbls. of 16.1 gravity oil daily from a depth of 3,154 feet. The production of this new well was still cutting about 8 per cent up to a late hour. It is interesting to note that both of these new fields yield heavy oil.



Wildcatting activities in California during the past year have been unusually successful, prospecting work resulting in the discovery of six or seven new fields since January 1, 1927. The Miley Exploration Co. started off the past year with a new field at Goleta in Santa Barbara County during the early part of February and this district, incidentally, was subsequently extended by the Barnsdall Oil Co., which opened up what appears to be a continuation of the Tecolote anticline, although a well-defined fault separates the two areas. Three months after the discovery of Goleta the Elbe Oil Co. surprised many of the boys by finishing a commercial producer in what is now the Round Mountain Field located in Kern County 15 miles north of Bakersfield and approximately 10 miles east of Mount Poso which was opened up by the Shell in August, 1926.

The Associated then focused the spotlight on Los Angeles Basin by bringing in No. 1 Cypress, the discovery well at Potrero, which begun flowing to sump at the rate of approximately 200 bbls. of 39.5 gravity oil daily on October 15 last after a voluntary suspension since November, 1926, at which time drilling operations were stopped because of the unsettled conditions existing within the industry. The Seacliff Field, located 6 or 7 miles west of the prolific Ventura Avenue Field, was the fourth wildcat area to be proven productive during the past year, the discovery well, No. 1 State of the Pan American, being finished during the early part of November flowing at the rate of 1,000 bbls. per day. Water trouble developed in this hole a short time after completion and while it is still off production the company's No. 3 Hobson recently removed all doubt as to the existence of commercial production as it was brought in flowing 916 bbls. of exceptionally clean 39 6 gravity oil daily.

Geis & Bradford opened up California's fifth field by finishing their wildcat up on Sulphur Mountain in Ventura County, Section 21-4-22. The discovery well, which was finished about the middle of November, 1927, after a series of preliminary tests, registered an initial of 100 bbls. daily from 1,997 feet, the oil being of a good grade and testing 28.1 degrees. The Sulphur Mountain Field of Ventura County does not show any evidence of substantial production at the present time and for this reason the production of this area will probably continue to be grouped with the several other productive fields in Ventura County. The Continental has recently taken over this property and a second test is already on the way down. The General Petroleum and Union wound up the year of 1927 by finishing No. 1 Glide and No. 1 Tribe in what may possibly prove another new field in the Granite Canyon area of Kern County. There is a difference of opinion among geologists as to whether the General Petroleum and Union have opened up an entirely new field or merely extended the outer limits of the Mount Poso Field a little over 2 miles southeast. When this work was originally undertaken these two companies were looking for a new field and the discovery reflects credit on the geological departments of the two concerns mentioned as each was firmly convinced that an accumulation of oil in commercial quantities might be anticipated.

Other Promising Areas

The year of 1928 has really started off more auspiciously than 1927 for, with two new fields already opened up in the first 10 days of January and two more exceptionally promising wildcat areas showing oil, the coming 12 months may witness the discovery of a larger number of new fields than resulted from aggressive prospecting during the past year. The vast undeveloped acreage in the San Joaquin Valley may yield a number of new fields from time to time as the years roll on. California's present tremendous reserves are too great to be appreciated and under forced intensive drilling this state could probably produce 1,500,000 bbls. per day for a limited period of time. This, of course, will not materialize but it indicates the tremendous possibilities of present producing acreage. Long Beach, Seal Beach, Dominguez, Inglewood, Brea Olinda, Coyote, Ventura Avenue, Seacliff, Potrero, Mount Poso, Round Mountain and other proven fields throughout the state are all susceptible to additional development and many of this group have deep sands being held in reserve.

Ventura

The Shell established a new world's record for large deep production in finishing No. 18 Edison, a new well in the Ventura Avenue Field which blew in during the early part of the week flowing 3,750 bbls. of clean 30.1 gravity oil and approximately 5,000,000 feet of wet gas daily from the 7,015-foot level. Several oil wells have been finished at a greater depth than No. 18 Edison of the Shell but no producer below the 7,000-foot level has ever registered as large an initial daily production. The Miley Oil Co.'s No. 6 Athens in the Rosecrans Field holds the world's record in point of depth, 7,295 feet, but this project never proved commercially profitable as it failed to sustain its initial production. The Chanslor-Canfield Midway Oil Co. has the distinction of drilling the deepest hole ever put down by either cable tools or rotary equipment. This was No. 96 Olinda, which was finally abandoned as a duster during the early part of the present week at 8,201 feet. The Standard drilled a 7,212-foot dry hole on the Brownrigg-Keller lease at Santa Fe Springs several years ago while the Union carried its No. 1 Gardena down to 7,319 feet before abandoning.

It is with particular pride that the achievement of the Shell is chronicled at this time as the writer predicted about two years ago that production might be anticipated in the Ventura Avenue Field down to at least the 7,000-foot level. The Petroleum Securities finished its second well on the Willett property in this field early in the week and this new producer, No. 2, registered an initial of 2,160 bbls. of fairly clean 29.3 gravity oil and 1,000,000 feet of wet gas daily from 6,615-foot level. No. 3 on the same lease is nearing completion at present and this well, which will probably be finished within the next 30 days, will be followed into production by No. 4 Orton, which recently passed the 5,700-foot level. The Associated's No. 39 Lloyd is showing a lot of kick at 6,566 feet, in fact, the crew was obliged to take exceptional precautions to prevent a premature blowout. No. 51 Lloyd at 6,150 feet and No. 102 Lloyd at 6,000 feet are also showing up exceptionally well.

Seacliff

The outstanding development in the Seacliff Field during the week was the actual starting of the General Petroleum's pipe line from this field to Ventura and while a preliminary survey has been made of the feasibility of extending this line to Newhall for connection with the company's main trunk, which extends from Midway-Sunset to Los Angeles, no decision has been reached as to when this will be undertaken. The company's new line is designed principally to carry anticipated production from the Seacliff Field to

Ventura where it will be connected with the Associated Oil Co.'s tanker facilities. Another interesting development during the week was the formulation of plans for the erection of an absorption plant in this area by the Pan American. The natural gas produced at Seacliff averages a little less thn 3 gallons of casinghead to each 1,000 feet of natural gas and with additional producers nearing completion it is believed the company will have material on ground for its new plant in the very near future as gas production is bound to show an appreciable increase during the next 60 or 90 days.

The Standard Oil Co. is establishing a field office at Ventura in order to facilitate development of the Southern Pacific Railroad's right of way, a recent acquisition in the Seacliff Field where the company will soon spud in its first well. The Standard is also doing considerable wildcatting work in Ventura County at present and the new office will therefore serve a double purpose. No. 3 Hobson of the Pan American, the first successful producer to be finished in the Seacliff Field, is still holding up in good shape several weeks after completion and no indication of an appreciable decline has as yet become evident, although a normal settling will naturally take place. Several drilling projects in this field picked up the top of the pay during the past few days and two or three new wells are expected to be finished during the course of the next two weeks. The Honolulu Consolidated closed negotiations about 10 days ago for the Graham tideland drilling permit which covers approximately 120 acres but since tideland drilling is under the ban this transaction is of no special importance at the present time.

New Sand at Bakersfield

One of the most important developments in California during the week from a wildcatting standpoint was the coring of a very promising and well-saturated oil sand in the Pacific Eastern Production Co.'s wildcat in the Union Avenue area at Bakersfield in Kern County. The importance of this find is especially significant because the opening up of a new field at this point in the near future will further complicate the already serious production situation. Drilling was concluded at 5,239 feet and another string of pipe will be landed preparatory to an early test. The importance of this find by the Pacific Eastern lies in the fact that a new field will be opened up if commercial production is secured, and since lease requirements call for the starting of approximately 25 wells within 30 days after the completion of the initial producer in this district there is a possibility of early substantial production. The Pacific Eastern is the largest single holder of potential acreage in this section and while no town lot drilling is anticipated the numerous small parcels of 5 and 10-acre tracts may result in more than a normal amount of drilling. Practically every major company has taken protective acreage although all of them may not get into the play because of the failure to secure diversified holdings. Instead of playing the law of averages by taking acreage both north and south of the Pacific Eastern's well several concerns have staked everything in one direction. Attention has been directed to the possibilities of this wildcat on numerous occasions during the past several months and while it may not be on the apex of the structure there is no questioning the fact that it has indicated the possibility of the existence of oil in the immediate area.

This well first broke into the limelight last summer when it shot an intermittent but solid stream of oil up over the crown block on several occasions from the 4,392-foot level. The company was unable to finish the well as a commercial producer, however, due possibly to mechanical trouble which resulted from the terrific gas pressure encountered during the course of work. Several gas blowouts occurred and the use of heavy rotary drilling mud required to keep the well under control may have also been a contributing factor in thwarting the company's efforts to finish it as a commercial producer in the upper zone.

The sand found in this well a few days ago is a deep zone and apparently has no connection whatever with the horizon encountered around the 4,300-foot level. It is impossible of course to say that the Pacific Eastern is absolutely assured of production as this is never certain until the oil is actually running into the tanks but the outlook is exceptionally promising, however, and the importance of this find is reflected in the price of acreage which has gone almost beyond reason for wildcat territory. The Pacific Eastern has a rig going up 600 feet north of the original test and location has just been staked for another well a similar distance to the south. The Pacific Eastern also has a very promising test in the Fruitvale area a few miles northwest of Union Avenue and the coring of a good looking oil sand makes this section look almost as good as Union Avenue. Both districts are located on the Bear Mountain sheer zone and if oil is secured in one area it may also be expected in the other. Watch these two districts very closely for every indication points to the development of commercial production.

The deep sand exploitation campaign under way in the Long Beach Field has caused a very appreciable decline in drilling operations in many other fields throughout the State during the past 30 days and completions during this period have consequently become rather infrequent. There will probably not be any marked change in any of the older fields until Long Beach goes over the top some time within the next three or four months and it is possible that this period of inactivity will be lengthened still further if other prolific fields are opened up. Ventura Avenue, Seacliff and Kern River are the only districts which have not reflected the deep drilling in the Long Beach Field by showing a decline in the amount of development work under way. This is because of the satisfactory results which have attended the efforts of operators drilling in these three fields. The Union Avenue and Fruitvale wildcat areas near Bakersfield in Kern County may also show increased drilling during the course of the next several months if either of the wildcats in these sections is brought in as a successful commercial producer. Lease requirements call for early work and if this first group secures production it is logical to assume that a very substantial amount of additional drilling will be undertaken with as little delay as possible.

Long Beach

There were only two wells finished in the Long Beach Field during the past week but a check of present drilling operations indicates the probable completion of several more in the immediate future. The Delaney Petroleum Corp., George F. Getty, McMillan & Campbell, Pan American, Richfield and several other independent operators should list one or more new wells within the next two weeks. The Shell, which is running 17 strings of tools in the Long Beach Field at the present time, should have No. 11 Cresson on production within the next 10 days and this potential producer should be followed by several more in less than 30 days. The wells put on production during the past seven-day period were No. 7 Booth of the Richfield Oil Co. and No. 13 Long Beach Community of the Union. The former, a recompletion after being redrilled and deepened to the lower zone at 6,295 feet, came in under a natural flow doing 1,675 bbls. of 28.1 gravity oil and approximately 1,500,000 feet of wet gas daily. The Richfield's next completion at Long Beach will be No. 5 Delaney unless something unforeseen develops as this well is at present being prepared for production at 6,217 feet.

The Union's No. 13 Long Beach Community was given a preliminary production test several weeks ago from the 5,608-foot level but the failure to result in substantial production resulted in its being carried down to 6,035 feet. The additional hole added, however, did not have the desired effect as it is only making approximately 300 bbls. per day at the present time. Considerable new work is still getting under way at Long Beach and a check indicates that there is no letup yet in sight. The California Eastern, California Petroleum, George W. Johnson, Continental Oil Co., George F. Getty, Greek-American Oil Co., Miley Oil Co., Richfield and the State Oil Co. all started additional new projects during the past seven-day period.

Seal Beach

The depletion and exhaustion of the Selover, Wasem, Wahl and other horizons in the town lot area of the Seal Beach Field has brought drilling operations to a standstill in this area and while some holes are being worked over this is for corrective purposes only and done to stimulate production. Drilling operations in the older section of the Seal Beach Field are also at a low ebb but developments during the past week or 10 days indicate a possible resumption of drilling with a new deep horizon as the objective. The Marland and Richfield are reported to have picked up a new sand below the 6,000-foot level and the former has already taken four wells off production in the Selover zone for deepening. These holes are probably being deepened to protect this lease from undue drainage by town lot operators but there is nevertheless a possibility that the Standard and Associated may

(Continued on Page 124)

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Company, Well and Location—	S-T-R	Depth	Status
Associated, No. 1 Cypress, Potrero	34- 2-14	5,468	recemented
Smith & Carpenter, No. 1 Smith, Potrero	35- 2-14	5,415	cemented
Pet. Securities, No. 1 Connolly, Potrero	27- 2-14	Rig	rigging up
Hurst Oil Corp., No. 1 Inglewood, Los Angeles Co.	28- 2-14	3,772	suspended
Mont. Park. Oil Co., No. 1 Browning, Mont. Park.	36- 1-13	3,750	hd. sd. drilling
Associated, No. 1 Patterson, Pico	13- 2-13	4,270	fishing
Circle Oil Co., No. 1 Pomeroy, Manchester	23- 3-14	4,280	suspended
Shell, No. 1 Mission, San Fernando	4- 2-15	4,928	plug back
Sou. Calif. Drlg. Co., No. 1 Matteson, El Segundo	1- 3-15	4,870	suspended
Carr, O. K., No. 2 Foster, San Juan Capistrano	13- 8- 8	4,230	suspended
Andrews, Otis, No. 1 Lancaster, Los Angeles Co.	23- 8-13	900	set. surf. pipe
Southwest Pet. Co., No. 1 Ramsauer, Watts	4- 3-13	4,302	suspended
Security Pet. Co., No. 1 Lynwood, Los Angeles Co.	13- 3-13	1,801	sd. sh. drilling
Dominguez Est., No. 1 Compton, Los Angeles Co.	27- 3-13	5,510	land pipe
San Clemente Oil Co., No. 1 Peck, Hawthorne	20- 3-14	5,760	will test
O'Donnell, J. E., No. 1 Dupree, Hawthorne	29- 3-14	5,304	suspended
White Behr, No. 1 Watson, L. A. County	21- 4-14	4,240	hd. sd. drilling
Shell, No. 1 Allec, Placentia	31- 3- 9	5,655	fishing
Buttrum, F. W., No. 1 Richfield, Orange Co.	36- 3- 9	1,003	sd. sh. drilling
Son, C. A., No. 1 Pinkerton, Orange Co.	6- 5-11	3,620	suspended
Olympic Refg. Co., No. 1 Sunset Beach, Orange Co.	19- 5-11	911	sd. drilling
Getty, J. Geo. Jr., No. 1 Seal Beach, Orange Co.	14- 5-12	Rig	rigging up
Shell, No. 1 Stern, Orange Co.	22- 3-10	3,392	hd. sd. drilling
Hemet Pet. Co., No. 1 Ward, Riverside Co.	9- 5- 1	1,893	hd. sd. drilling
Fuller & Gray, No. 1 Puente, L. A. County	14- 2-10	Rig	suspended
Anchor Oil Co., No. 1 Hudson, Los Angeles Co.	19- 2-10	2,395	suspended
Mesa Pet., No. 1 Newport, Orange Co.	21- 6-10	1,460	hd. sd. drilling
Pet. Securities, No. 1 Fairview, Orange	3- 6-10	4,591	hd. sd. drilling
Davenport O. & G., No. 1 San Marcos, San Diego	30-12- 2	350	hd. sd. drilling
Turner, S. S., No. 1 Escondido, San Diego Co.	26-12- 2	320	sd. drilling
Mills, J. P., No. 1 Pueblo, San Diego Co.	.....	708	sd. drilling

IMPORTANT NORTHERN CALIFORNIA WILDCATS

General Pet., No. 2 Ochsner, Kettleman Hills	26-22-18	6,050	br. sh. drilling
South Coalinga, Well No. 1, Kettleman Hills	35-24-19	2,950	bl. sh. drilling
Monocline Dev. Co., Well No. 1, Kettleman Hills	7-21-21	4,308	suspended
McPhail, Hugh, Well No. 1, Kettleman Hills	13-24-18	2,095	suspended
Milham Expltn., No. 1 Kettleman, Kings Co.	2-22-17	6,338	hd. sd. drilling
Shell, No. 2 Berlywood, Moorpark	32- 3-20	6,251	hd. sd. drilling
Continental Oil Co., No. 1 Burnham, Ventura Co.	23- 5-18	3,650	gr. sd. drilling
Star Petroleum, No. 2 Canet, Ventura Co.	13- 3-22	4,371	hd. sd. drilling
Standard, No. 1 Camarillo, Ventura Co.	29- 2-20	5,720	testing
Standard, No. 2 Saticoy, Ventura Co.	9- 3-22	1,100	sd. drilling
Petroleum Sec., No. 1 Diablo, Ventura Co.	26- 5-18	4,060	gr. sd. drilling
Parkford, E. A., No. 1 Strathern, Ventura Co.	5- 2-18	4,002	rigging rotary
Shell, No. 1 Strathern, Ventura Co.	6- 2-18	1,980	hd. sd. drilling
Miley Oil Co., No. 1 Red Mountain, Ventura Co.	7- 3-23	980	suspended
Richfield, No. 27 Piru, Ventura Co.	35- 5-18	1,902	abandoned
Keck Inv. Co., No. 1 Fillmore, Ventura Co.	33- 4-20	2,148	hd. sd. drilling
McAdams, J. E., No. 1 Buttonwillow, Kern Co.	26-29-23	3,400	br. sh. drilling
Milham Expltn., No. 2 Buttonwillow, Kern Co.	8-28-23	4,662	gas well
Milham Expltn., No. 2 Kern, Kern Co.	8-28-23	2,580	hd. sd. drilling
Milham Expltn., No. 3 Buttonwillow, Kern Co.	7-29-24	4,150	suspended
Semitropic Oil Co., No. 1 Semitropic, Kern Co.	21-26-22	Mtl.	building rig
Pacific Eastern, No. 1 Fruitvale, Kern Co.	21-29-27	3,851	fishing
Pacific Eastern, No. 1 Union Ave., Kern Co.	6-30-28	5,239	oil sand
Pacific Eastern, No. 2 Union Ave., Kern Co.	6-30-28	Rig	rigging up
General Pet., No. 1 Edison, Kern Co.	5-30-29	4,006	200 bbls. daily
Superior Oil Co., No. 1 Edison, Kern Co.	24-29-29	Mtl.	building rig
Getty, George F., No. 1 Edison, Kern Co.	22-29-29	3,717	plugging back
Stabler, W. W., No. 1 Comanche Point, Kern Co.	23-32-29	.....	location
Midway Northern, No. 1 Edison, Kern Co.	29-29-30	1,689	br. sh. drilling
Frame, Bruce, No. 1 Paso, Kern Co.	18-26-23	2,480	hd. sd. drilling
Shell, No. 1 Corral Canyon, Kern Co.	10-26-25	Mtl.	building rig
Shell, No. 1 Mon Bluff, Kern Co.	2-28-28	3,790	hd. sd. drilling
North American, No. 1 Wallace, Delano	5-25-26	3,703	hd. sd. drilling
Fresno Madera Oil Co., No. 1 Clovis, Fresno	18-12-21	3,998	hd. sd. drilling
Barneyberg Oil Co., No. 1 Brown, San Luis Obispo	26-32-14	2,291	hd. sd. drilling
Richfield, No. 1 Wreden, San Luis Obispo Co.	10-29-17	2,601	fishing
Miley Oil Co., No. 1 Carissa, San Luis Obispo Co.	15-29-17	2,540	suspended
Union Oil Co., No. 1 Huasna, San Luis Obispo	34-32-15	986	sd. drilling
Shell, No. 1 Cowell, San Mateo Co.	8- 6- 5	5,500	hd. sd. drilling
Shell, No. 1 Rossi, Petaluma	8- 5- 6	609	sd. drilling
Thomas & Hammill, Well No. 1, Alameda Co.	16- 3- 3	1,470	suspended
Buttrum, F. W., No. 1 Odin, Santa Barbara Co.	20-25-27	1,968	suspended
Gorham, G. O., No. 1 Orcutt, Santa Barbara Co.	33-10-34	Mtl.	suspended
Becker, Geo. F., No. 1 Summerland, Santa Barbara	33- 4-25	3,060	testing
Twin State Oil Co., No. 1 Modoc, Santa Barbara	20- 4-27	2,293	sd. sh. drilling
Birch Oil Co., No. 1 Porterville, Tulare Co.	13-20-26	3,161	show. gas
Fort Wayne Syndl., No. 1 Goodcell, Madera Co.	22-10-17	2,250	fishing
Continental Oil Co., No. 2 Smith, Colusa Co.	31-18- 4	4,360	hd. sd. drilling
Continental Oil Co., No. 1 Sargent, Santa Clara Co.	31-11- 4	1,456	to test

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total This Week	Daily Average	Total Last Week	Daily Average	This Year to Date	Same Time Last Year
Crude oil	332,544	47,506	96,410	13,773	428,954	216,067
Fuel oil	.....	.....	.....	.....	.....	700,602
Diesel and gas oil	72,180	10,311	.....	.....	72,180	145,737
Gasoline	190,088	27,155	171,617	24,517	361,705	654,452
Coastwise—						
Crude oil	313,012	47,716	260,617	37,231	573,629	1,491,606
Fuel oil	471,930	67,419	222,070	31,724	694,000	772,819
Diesel and gas oil	84,145	12,021	49,098	7,014	133,243	.....
Gasoline	220,920	31,561	196,371	28,039	417,197	618,038
Kerosene	10,453	1,493	.....	.....	10,453	16,344
Tops	30,500	4,357	.....	.....	30,500	.....
Exports—						
Crude oil	54,100	7,729	.....	.....	54,100	123,726
Fuel oil	429,660	61,380	459,948	65,707	889,608	1,293,359
Diesel and gas oil	51,500	7,357	10,249	1,464	61,749	30,085
Gasoline	.....	.....	156,499	22,357	156,499	114,770
Kerosene	61,800	8,829	3,191	456	64,991	136,251

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Diesel and gas oil	.....	.....	93,515	13,359	93,515	.....
Gasoline	.....	.....	75,477	10,782	75,477	94,961
Lubricants	.....	.....	.....	.....	.....	58,110
Coastwise—						
Fuel oil	147,500	21,071	198,968	28,567	256,468	123,575
Diesel and gas oil	.....	.....	.....	.....	.....	103,902
Gasoline	.....	.....	75,591	10,799	75,591	350,523
Kerosene	.....	.....	29,862	4,266	29,862	3,680
Exports—						
Fuel oil	124,248	19,178	.....	.....	124,248	73,807
Gasoline	83,411	11,916	77,816	11,116	161,226	99,474
Kerosene	.....	.....	.....	.....	.....	60,780

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Indiana Well Best in Central West

Pike County Completion Good for 70 Bbls. Initial. Michigan Fields Assured Active Drilling Campaign in Spring

By Whit
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Jan. 16.—Development work in all divisions of the Central West Field is at low tide due to weather conditions, and very few wells are being brought in and less new wells are starting as material can not be handled off the highways, as the thawing of the ground makes it impossible to get to new locations. The Lima Field is credited with five new wells, Indiana, with one, Illinois with two and Central Ohio with eleven, making a total of nineteen completions since the last report.

Lima Field

In the Lima Field of northwestern Ohio, the best of the late completions was made by the Roundhead Oil & Gas Co., in No. 5 well, 600 feet from the south line and 250 from the east line of the Mary J. Austine No. 2 farm, where the sand was topped at 1,428 feet and went 44 feet in the sand, the initial pumping bringing forth 40 bbls., which is considered a very good well for the Trenton Rock formation at this time. The Hardin Oil & Gas Co. is starting No. 10 on the A. R. Zimmerman farm, both being in McDonel Township, Hardin County.

North of Tiffin, near Bettsville and Cromer, in Liberty Township, Seneca County, the Wiser Oil Co.'s test in the southeast corner of the Andrew Kimmitt farm in the southeast quarter of Section 20, pumped 10 bbls. initial. Top of sand in this well was found at 1,350 feet and sent 140 feet in the sand to a total depth of 1,490 feet. J. H. Murphy and Son drilled in No. 3 well, 600 feet from the north line and 250 from the east line of the David Hunker farm, in the southwest quarter of Section 21, same Township, getting the top of the Trenton at 1,371 feet and going 239 feet in the sand, without finding commercial production and goes down as a dry hole. This Hunker property is known on the oil map as the old G. A. Tucker farm, and some months ago the initial well on the lease showed 90 bbls., but the last two drilled were failures.

In Jennings Township, Van Wert County, J. H. Reynolds and others' No. 6 well, 850 feet from the south line and 250 from the west line of the Phillip Louth farm, in the southwest quarter of Section 5, pumped an initial of but 2 bbls. from a total depth of 1,198 feet or 50 feet in the sand.

West of Findlay B. Porter and others' No. 22 well, 600 feet from the north line and 1,000 from the east line of the Henry Deeds farm, in the southeast quarter of Section 6, Eagle Township, Hancock County, showed an initial 24 hours' pumping of 25 bbls. Sand was found at 1,300 feet and oil at 95 feet in the sand to a total depth of 1,395 feet.

The Lima Field shows less activity than at any period for more than 30 years, although good weather at the opening of Spring should bring about considerable work as there are many spots on both sides of the present producing areas, while the inside of the defined limits has by no means been thoroughly drilled, there still being thousands of locations left that should mean at least wells with a production from a couple up to 15 bbls. initial. Wells can be drilled at little cost as power pumping plants are already installed and all that is required is casing, drive, tubing and line pipe, with no expense for new power plants which run into money rapidly.

Operators are taking their usual winter's outing away from the producing regions, some in California, others in Florida and some have gone abroad.

Central Ohio Field

The Central Ohio Field is not bringing in its usual good oil wells as was the case a few months ago, most of the wells being gas producers with a few dry holes. Eleven wells were reported from the big district since the last report and but two of them were oil wells, the initial being 10 bbls. each. One was a dry hole and 8 were gas producers. The large gas companies are doing the bulk of the drilling, in fact have been doing it for many years.

In Sullivan Township, Ashland County, the Kemrow Co. brought in a nice gas well in No. 5 well, 500 feet from the north line and 450 from the west line of the J. A. Spencer 138 acres, Lot 79. The Ohio Fuel Gas Co. is drilling a test 1,100 feet from the north and west lines of the W. E. Richards farm, Lot 48, same township, and the Logan Gas Co. is starting a second test 1,160 feet from the north line and 450 feet from the east line of the John J. Smith 80 acres, Lot 82, same township. In Clear Creek Township, same county, Hulse & Kundtz are credited with a dry hole at a test in the northwest corner of the M. Bandeen 13 acres, Section 12. Faulkner and others' are drilling a test on the Elizabeth Baldorf 43 acres, Section 14, same township, located 60 feet south of the road and 100 feet east of another highway. In the same township, Section 11, Brown, Shriver and others' are drilling a test between two roads on the R. P. Henderson 10 acres, Section 11.

In the Chatham Field, in Chatham Township, Medina County, the Oko Oil & Gas Co.'s No. 16 on the T. W. Brinker farm, Lot 6, Section 14, showed an initial production of 10 bbls., from a depth of 350 feet. This is an exceptionally good producer for the shallow producing sand.

In Monroe Township, Holmes County, the Empire Gas & Fuel Co.'s test on the M. G. Bird 100 acres, Lot 16, is an average gas well. This company is starting a test 440 feet from the north line and 550 from the east line of the F. C. Close 100 acres, Lot 23, same township. In Richland Township, the East Ohio Gas Co. is starting a test 660 feet from the north and west lines of the A. E. Harford 97 acres, Section 14.

Lorain County

In Columbia Township, Lorain County, the Ohio Fuel Gas Co.'s test 1,000 feet from the south line and 550 from the west line of the L. D. and J. Richards 50 acres, Lot 5, is above the average gas producer. Empire Gas & Fuel Co.'s test on the G. M. Brooks 60 acres, Lot 15, is another fair gas well, and a second well is starting 400 feet from the north line and 600 feet from the east line of the same farm.

In Monroe Township, Coshocton County, the East Ohio Gas Co.'s test, 875 feet from the north line and 675 from the west line of the C. L. Dalrymple 100 acres, Section, came in a duster.

In the Cleveland Field, Olmstead Township, Cuyahoga County, J. B. Harrison Co.'s test, 250 feet from the north line and 125 from the east line of the W. D. Camp 3 acres, Lot 30, is credited with a production of 10 bbls. initial. This company is drilling No. 1 in the southwest corner of the Schuman ¾-acre Lot 30. Hulse & Kundtz made a nice strike at a test, 650 feet from the north line and 275 from the west line of the A. W. Eldred 55 acres, Lot 29, same township, it being above the average good well of the gas field. No. 2 same farm, is under way. The Logan Gas Co. struck a gas well above the average at No. 1 well, 734 feet from the north line and 250 from the west line of the J. B. Hall 29 acres, Lot 4, same township. In Strongville Township, same county, the Empire Gas & Fuel Co. has a good gas well at a second test in the northeast corner of the H. M. and M. O. Whitney 65 acres, Lot 32.

Bell Brothers and others' are starting a shallow sand test in the northeast corner of the Lillian Pugh 125 acres, Section 8, Union Township, Licking County. East Ohio Gas Co. is drilling a second test on the Robert Miller 162 acres, Section 28, Franklin Township, Summitt County.

Indiana Field

Only one well was reported completed from Indiana but that was a good one. It is Perry C. Andrews' No. 9 well, 900 feet from the south line and 185 from the south line of the Enos Loveless farm, in the southeast quarter of Section 14, Logan Township, Pike County, with an initial production of 70 bbls. Sand was found at 1,341 feet and drilled 49 feet to a total depth of 1,390 feet and shot with 100 quarts.

Illinois Field

Two completions were the best the Illinois Fields could report for the week. In Lawrence Township, Lawrence County, the Ohio Oil Co.'s No. 15 in the southeast corner of the J. T. Griggs, No. 3 farm, in the southwest quarter of Section 10, pumped 10 bbls. from the Kirkwood sand at 1,603 feet. In Bridgeport Township, same county, the same company abandoned Nos. 10 and 24 on the J. L. Kimmel No. 1 farm, Section 31.

In Wabash Township, Wabash County, the Adams Corner Oil Co.'s No. 13 well, 600 feet from the north line and 800 from the east line of the Mack Madden farm, in the southeast quarter of Section 6, was a dry hole at a depth of 1,390 feet. In Friendsville Township, same county, Healey and Lee abandoned Nos. 1 and 2 E. Bass farm, Section 19, east of the town of Friendsville.

The bringing in of the good producer by the Muskegon Oil Co., near Muskegon, in Muskegon County, across the State almost directly west of Saginaw, caused much excitement and many of the scouts left Saginaw for that point to secure leases, but a few days later were rushing back to Saginaw to look over the reported find of a 20-bbl. well some few miles to the southwest from Saginaw in the southeastern portion of Gratiot County. This test was drilled by Miller and others' on the C. B. Horrie farm, Section 22, Elba Township, Gratiot County, and not far from Ashley, where the Sun Oil Co. brought in a gas well last May on the Suttliff farm, reported good for around 1,000,000 feet at a shallow depth of 470 feet. The new well on the Horrie farm found both oil and gas

(Continued on Page 120)

WILDCAT IN MUHLENBERG COUNTY HOPED TO OPEN NEW TERRITORY

By Whit
Staff Correspondent, Kentucky-Tennessee

BOWLING GREEN, Ky., Jan. 14.—Development work has been shut down in all parts of Kentucky and Tennessee due to the cold weather that froze up the water lines, making it impossible to run the drilling tools. This gives the drillers and toolies a breathing spell, for they certainly will be busy in the western Kentucky division as soon as the weather moderates, as a heavy drilling campaign is in prospect in several counties, particularly in Ohio, Daviess, McLean, Hancock and adjoining counties where leasers have been busy blocking acreage.

Without doubt one of the most important ventures now being made in any part of Kentucky, is the test of the Ohio Oil Co. on the old Baxter farm, about one-half mile southeast of Central City, in Muhlenberg County, and this well is being watched with much interest by many oil men from all sections of the country. This test is to the southwest of Hartford, the county seat of Ohio County, almost directly west of Morgantown, the county seat of Butler County, directly south of Livermore, in McLean County, and northwest of the Warren County Fields. Should this well prove a producer of note it will open a wide area of undeveloped acreage and will bring about a heavy drilling campaign. Much leasing has been done in the vicinity not alone by the Ohio Oil Co., but by other large operating concerns. A block of acreage consisting of about 4,000 acres has been blocked by Owensboro parties in a direct southwest trend and about 5 miles from the drilling well of the Ohio Oil Co. on the Baxter farm, in an area where no land had ever been leased for oil or gas development, coal or other minerals. This being far in advance of production means that new pastures will be tested as soon as weather will permit. Leases in that area are being taken at one-eighth royalty, and one year to start development, thereafter 50 cents per acre and $125 for gas wells. If no well is drilled within a year from the date of the lease the rentals start at 50 cents per acre per year, but must be paid quarterly. Reports are that many of the late leases in the western Kentucky Division are taken on what is known as "Producers 88 Kentucky Form," which gives 4-year leases, one-eighth royalty and $125 for gas wells when utilized off the premises. This is mentioned as it will give an idea of what leasers must contend with.

The big drilling play is centered around Ohio County as a whole, Daviess, McLean and Hancock Counties, and some wildcat work is going on in adjoining counties.

Week's Completions

Only two wells were reported completed since the last report although numerous wells in advance of pipe line connections are reported in the sand, making good showings, especially in Ohio, Daviess and McLean Counties. The two completed wells are in the old territory south of Bowling Green, in Warren County and are the Thompson Oil Co.'s No. 9, which is 500 feet from the north line and 750 feet from the west line of the H. M. Bryant farm, District 5, rated good for 4 bbls. from the deep sand at 1,112 feet, and G. B. Dunning's No. 8 well, 300 feet from the north line and 959 from the west line of the Elizabeth Morehead 57 acres, same district, which is a 3-bbl. pumper in the deep sand at 1,160 feet. No other completions were reported in either the eastern or western divisions of the state.

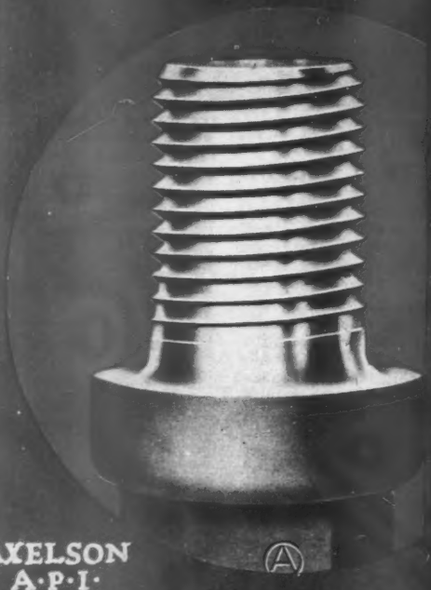
December Oil Runs

A total of 429,754.40 bbls., of crude

(Continued on Page 120)

a preponderance of evidence proves Axelson service

2 rods in full production



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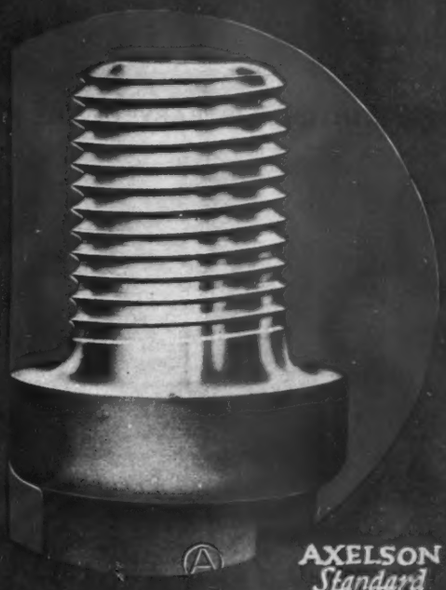

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Axelson SUCKER RODS

EQUIPMENT AND SUPPLIES

LUG ON WRENCH HANDLE WITHSTANDS SIDE PULL

Reinforcing lugs, a part of the handle, which prevent spreading of the frame when abused by severe side pulling, are a new feature of Trimo pipe wrenches that is expected to prove of special value in the oil field. These lugs are said to withstand the hardest side strain to which a pipe wrench may be subjected. The improvement appears on all sizes of the Trimo steel-handled pipe wrenches from 16-inch to 48-inch.

The new 1928 catalog of the Trimont Manufacturing Co., Boston, Mass., shows an added size of Trimo wrenches. The "open" length formerly skipped from 10 inches to 14. There now is listed a 12-inch wrench, taking one-eighth-inch wire to 1¼-inch pipe. Besides pipe wrenches the catalog describes Trimo chain wrenches, basin wrenches, monkey wrenches, auto wrenches, pipe cutters, pipe vises and parts.

SUPERIOR TUBE, INC.

For purposes of expansion and recapitalization, the name of the Superior Tube Co. has been changed to the Superior Tube, Inc., and the company will move its main offices in Tulsa, Okla., from the First National Bank Building to the Philtower. Officers of the Superior Tube, Inc., are Hoyle Jones, president and treasurer, J. D. Holloway, vice president and secretary, and D. E. Hubbard, assistant secretary and assistant treasurer

FOUR VICE PRESIDENTS APPOINTED BY LINK-BELT CO.

George P. Torrence, George L. Morehead, Frank B. Caldwell, W. C. Carter.

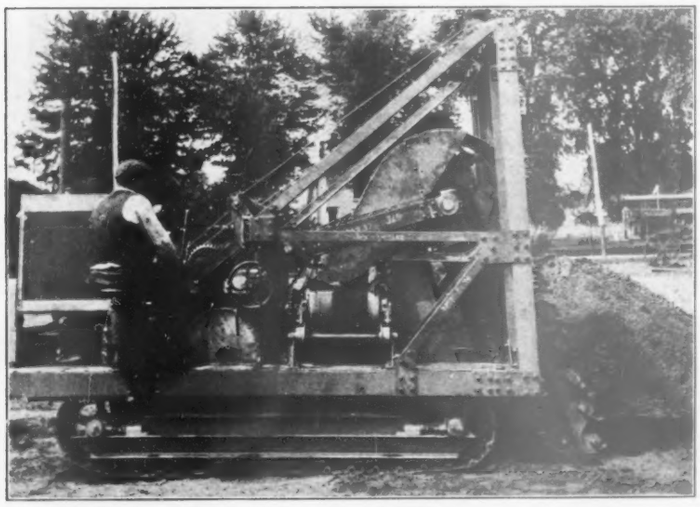
Link-Belt Co. announces the appointment of four vice presidents: George P. Torrence, with headquarters in Indianapolis, in general charge of Indianapolis operations and sales of Indianapolis plant products; George L. Morehead, Philadelphia, in charge of Eastern operations and sales; Frank B. Caldwell, in charge of the Chicago plant and tributary sales offices; W. C. Carter, in general charge of production at all plants, with headquarters at the general office of the company, 910 South Michigan Avenue, Chicago.

In addition to the foregoing the officers of the Link-Belt Co. are: Charles Piez, chairman, and Alfred Kauffman, president, both Chicago; Humphrey J. Kiely, vice president, New York, and Richard W. Yerkes, secretary and treasurer, Chicago.

GENERAL ELECTRIC CHANGES

H. F. T. Erben, assistant vice president of the General Electric Co., retired January 1, after more than 40 years of service with that company. B. L. Delack has been appointed manager of the Schenectady plant of the company and E. A. Wagoner has been appointed manager of the Pittsfield, Mass., plant. Sales organization changes include the appointment of C. N. Gregory as manager of the New Haven, Conn., office, succeeding Frederic Cutts, and appointment of R. B. Ransom as resident agent in charge of the Hartford office, succeeding Mr. Gregory.

NEW BUCKEYE DITCHER IS "BABY" OF THE FAMILY



Responding to the increasing need for smaller portable units of power-driven, labor-saving equipment, the Buckeye Traction Ditcher Co., Findlay, Ohio, has added the Model 150 service ditcher to its line of chain-and-bucket excavators.

This newest Buckeye is a little, light-weight ditcher, exceptionally flexible in performance. Proportionately, it has the rugged construction and economical working ability of the larger, more powerful Buckeye excavators. It has features which particularly adapt it to service line excavation and for operation in restricted quarters where big excavators are suitable.

An idea of Model 150 may be had from this general description: Cutting widths, 16, 18, 20, 22, 24 and 26-inch; cutting depths, 0 to 4, 6 and 8 feet. Overall dimensions: Width 6 feet 6 inches; height (with boom raised for travel), 10 feet; length (set for 8 feet cut and boom raised), 21 feet 8 inches; length (with boom at maximum digging depth), 18 feet; front of machine to rear of Alligator wheels, 12 feet; approximate weight, 18,000 pounds; 98 per cent steel construction, excluding power unit; one-man operation, all control levers being within easy reach.

A unique feature of Model 150 is its reverse digging traction, which enables it to dig while traveling backward. This permits tunneling under sidewalks or other obstructions, or removing spoil where trenches have caved. This Buckeye service ditcher can dig straight down beside a wall or building, since nothing projects or is carried back of the bucket line.

Crowding mechanism assures that the boom will not back away from the cutting face or rise on account of excessive traction feed.

LINCOLN ANNOUNCES A "SWITCH START" MOTOR

The Lincoln Electric Co., Cleveland, Ohio, announces a new "switch start" motor said to have several advantages and built in sizes from one-half to 30 horsepower for either 2 or 3 phase, 60 cycle current.

This motor can be started directly across the line without the use of a starting compensator, starting resistance or other voltage-reducing mechanism, with starting current below the requirements of the National Electric Light Association, which is the standardization organization of the power companies.

The chief claim of the new "switch start" motor is that operating characteristics, such as power factor, efficiency, maximum torque, temperature rise, etc., have not been sacrificed to gain low starting currents.

Equal or better efficiency and power factor from 5 to 10 points higher than the ordinary self-start motor are declared to characterize the "switch start" motor.

Tests are reported to show that starting torques of full load to better than 250 per cent of full load, depending on the horsepower and speed, are possible without exceeding the N. E. L. A. requirements as to starting currents.

From zero speed the curve of the "switch start" motor shows a gradually increasing torque up to the maximum torque point. On sudden high overloads it is asserted that the "switch start" motor has a high or maximum pull out torque which is of importance in that this motor will not stall on sudden high overloads.

Fusion Facts, devoted to welding, is published by Stoody Co., Whittier, Calif., manufacturer of welding equipment.

CAPITALIZATION INCREASED

The Emsco Derrick & Equipment Co. of Los Angeles, Calif., announces an increase from $3,000,000 to $5,000,000 in its capitalization. This development, made public by J. S. A. Smith, secretary and treasurer, makes Emsco one of the largest manufacturers of oil field equipment in the world in point of financial strength. The Emsco sales force now numbers about 50 men, according to Charles D. Wagner, vice president and sales manager, embracing the combined selling staffs of the Emsco Derrick & Equipment Co. and the D. & B. Pump & Supply Co. An addition to the administration building has been started that will double the floor space of the present structure. An addition to the general machine shop has been completed and new machines of extra large capacity are to be installed. Increasing production demands have necessitated a new unit exclusively for steam hammers. In the heat treating department, a new electric furnace, with double the capacity of the former equipment, is now in operation on a 24-hour schedule.

The B. & A. Specialty Co., of Tulsa, Okla., has been appointed Mid-Continent distributor for the Kerlow Steel Flooring Co., of Jersey City, N. J., which manufactures a line of fabricated flooring for gasoline and power plants.

For twenty years the Moore Tubular Steel Derrick has performed in a creditable—in fact a notable—manner. It is the oldest steel derrick in the field and has won the approval of oil men everywhere. Ease of erection and convenience in handling, strength, and long life are features of the Moore derrick which merit its position of leadership.

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for Twenty Years

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MEN KNOWN IN OILDOM

William Reinhardt

William Reinhardt, newly elected vice president of the Shell Company of California, joined that organization as a field engineer at Oilfields, Calif., during the early part of 1917, and continued in the employ of that concern for the greater part of the following four years. In recognition of his ability he was appointed assistant general field superintendent of the Roxana Petroleum Corporation in January, 1921, but his services in the Mid-Continent area were suddenly terminated several months later by a transfer back to California. During his absence the Shell company had started a wildcat up on Signal Hill and the completion of this discovery well during October, 1921, opened up Long Beach, California's most prolific field. The Shell was faced with a prospect of having to cope with an intensive town lot drilling campaign and the company accordingly dispatched a fast wire back to the Roxana for "Bill" Reinhardt, a very efficient and capable field man. He immediately returned to California and in October, 1921, was appointed superintendent at Long Beach and put in charge of all the Shell's drilling operations in that field. During his regime the Shell built up a very substantial production at Long Beach due to the successful completion of a large number of wells and efficient handling after being brought in. Two years later, during the latter part of 1923, Mr. Reinhardt was promoted to assistant general field superintendent with headquarters at the Los Angeles office and became general field superintendent during the early part of 1924. On July 1, 1926, Mr. Reinhardt was made manager of production, replacing William C. McDuffie, who at that time became general manager of production for the entire Royal Dutch interests. Mr. Reinhardt and Mr. McDuffie both worked up from the ranks and their merited promotions during the past several years have been received with considerable pleasure by the entire industry.

PERSONAL PARAGRAPHS

John Leonard has been elected a director of the Omar Oil & Gas Company.

* * *

H. B. Clark has been elected a director of the Beacon Oil Company of Boston, Mass.

* * *

W. G. Mitchell has been appointed assistant to the president of The Texas Company.

* * *

Robert Armitage, of the Smith Separator sales force, is making a trip through Kansas calling upon the trade.

Dr. W. E. Grisso, one of the royalty owners in the Seminole Field, paid a visit to Tulsa, Okla., last week.

* * *

J. S. Harrison, sales manager of the O'Neill Oil Company of Milwaukee, Wis., was a Tulsa, Okla., visitor last week.

* * *

V. S. Swisher, Oil City, Pa., secretary of the Southern Group of Pipe Lines, was a Pittsburgh, Pa., visitor last week.

* * *

J. F. Burgess, Oil City, Pa., chief accountant for the Southern Group of Pipe Lines, was a business visitor in Pittsburgh, last week.

* * *

R. T. Lyons, geologist for the Skelly Oil Company at Tulsa, Okla., visited the company's West Texas headquarters in San Angelo recently.

* * *

W. M. Lourcey, of the Gulf Production Company, Fort Worth, Tex., has returned to his duties following a business trip into West Texas.

* * *

James F. Corcoran, special representative for Trimont Manufacturing Company, Roxbury, Mass., is visiting Texas and Oklahoma fields.

* * *

E. D. Rattray, of the Gibson Oil Corporation, Amarillo, Tex., and Carl S. Aune of the same city, were recent business visitors in West Texas.

* * *

J. L. McMahon, district superintendent of The Texas Company's Wichita Falls, Tex., district operations, is recovering from a recent illness.

* * *

H. E. Clark, of the Laurel Oil & Gas Company, is spending a few weeks in Tulsa, Okla., and will return to his home in Philadelphia, Pa., next month.

* * *

Harold Whealton, of Whealton & Townsend, Inc., Los Angeles, Calif., was in Tulsa, Okla., last week, visiting the Mid-Continent headquarters of his company.

* * *

E. H. Leroux, president of the Oklahoma Pipe Line Company, spent a few days at Dallas, Tex., last week, and is now back at his desk in Muskogee, Okla.

* * *

W. P. Z. German, of the legal department of the Skelly Oil Company, left this week for California where he will spend several weeks in the interest of the company.

* * *

Dan Morris, Windsor, Ontario, representative of B. P. Corey & Son Company, has been appointed sales manager of that firm with headquarters at Petrolia, Ontario.

* * *

Tom P. Williams, of San Angelo, Tex., in charge of the land department in that district for the Roxana Petroleum Corporation, was a Fort Worth, Tex., visitor last week.

* * *

T. M. Magee, Keister, Pa., retired superintendent of the Southwest Pipe Line Company, and his sister, Mrs. Mary Bovard, have gone to Florida to spend the winter.

* * *

Joseph M. Wilson, geologist for the Simms Oil Company at San Angelo, Tex., has returned to that city following a couple of months spent in the main office at Dallas Tex.

* * *

L. L. Lookabaugh, division manager of the Roxana Petroleum Corporation's Wichita Falls, Tex., division, was a recent business visitor at the Dallas, Tex., office of the company.

* * *

John V. McMahon, former president of the Sinclair Oil & Gas Company, paid a visit to Tulsa, Okla., last week, en route to the Pacific Coast. Mr. McMahon now resides in New York.

* * *

H. C. Miller, petroleum engineer of the United States Bureau of Mines, with headquarters at San Francisco, Calif., has returned from a trip through the Eastern and Mid-Continent fields.

* * *

John J. Hill, of the Carter Oil Company's gasoline department, is now in South America observing conditions in his branch of the industry in the interest of the Standard Oil Company of New Jersey. He will return to the United States about April 1.

E. R. Perry, formerly general manager of the Cosden Oil & Gas Company, and now an independent oil producer of Fort Worth, Tex., visited his former home at Tulsa, Okla., last week.

* * *

A. M. Peairs has been in Tulsa, Okla., during the past week. He is now representing Ross Heater & Manufacturing Company, Pittsburgh Piping & Equipment Company, and the Bethlehem Steel Company with offices in the American Exchange Bank Building, Dallas, Tex.

* * *

G. B. Shea, associate petroleum engineer of the United States Bureau of Mines, with headquarters at San Francisco, Calif., has returned to his headquarters after an extended trip through the Mid-Continent and Texas fields in connection with the bureau's safety division.

* * *

M. Lloyd Freese, vice president of the Altitude Petroleum Company of Tulsa, Okla., was a Fort Worth, Tex., visitor this week, on business connected with West Texas operations in which his company is interested. The Altitude is part owner of the wells being drilled in Pecos County by the Olean Petroleum Company.

* * *

Robert Lee Craycroft, founder, and recently retired as president of the Craycroft Oil Company, will become associated with the Liberty National Bank in the near future. Mr. Craycroft sold his interest in the Craycroft Oil Company to the Beacon Oil Company several months ago. He had been in the oil business for over 25 years.

* * *

O. A. Kommers, president of the Kern County Chamber of Commerce, was recently elected president of the Taft branch of the California Chamber of Mines and Oil. Mr. Kommers, who succeeds John Stevens of the Associated Oil Company, is district manager of the San Joaquin Light & Power Company with offices at Taft, Calif.

* * *

H. A. Beasley, Albuquerque, N. Mex., well known throughout the Mid-Continent and at present operating in the Seven Lakes district of northwest New Mexico, was a recent visitor in the Texas Panhandle. Mr. Beasley was a former mayor of Bartlesville, Okla., and at one time rated among the big 20 of independent producers in Bartlesville.

* * *

R. F. Ley, sales manager of the Oilfield Equipment Company, has returned to New York after spending several days at the plant of the Joseph Reid Gas Engine Company in Oil City, Pa. Mr. Ley went to Oil City following a trip to Chicago and the Southwest. The Oilfield Equipment Company is the export sales representative of the Joseph Reid Gas Engine Company.

* * *

Dr. A. Wade Schwittala, executive vice president of the Roxana corporation, headed a group which inspected the industrial tract on the Houston, Tex., ship channel, and returned to Tulsa, Okla., by air. Others in the party were V. H. Smith, vice president of the North American Car Corporation, and Mrs. Smith, of Tulsa; R. W. Patterson, president of the Gulf State Terminal & Transfer Company, of Dallas, Tex., and T. J. Mullin, president of the Houston-American Petroleum Company.

* * *

A. C. Wilkes, pioneer oil man of California and at one time owner of the W. D. Head Drilling Company, has been elected vice president of the Italo-American Petroleum Corporation of California. Mr. Wilkes organized the old Commonwealth Oil Company and later purchased the Western Union Oil Company which properties formed the basis for the organization of the Union Oil Company of Delaware which later sold out its properties to the Shell Union Oil Company.

* * *

A number of New York officials of the Henry L. Doherty Companies were guests of H. R. Straight, general manager of the Empire Companies, and division managers, at the Hillcrest Country Club, at Bartlesville, Okla. They included Frank R. Coates, H. O. Caster, H. D. Freuauff, P. R. Jones, R. G. Griswold, Louis F. Musil of the executive committee; C. E. Weger, secretary of the executive committee, and Ed Korsmeyer. P. M. Miskell of Tulsa, Okla., manager of the refining division, and W. H. Merritt, Tulsa, in charge of the oil marketing department, were hosts with Mr. Straight.

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In construction, **"OILWELL"** Pumping Equipment is the handiwork of long-experienced machinists equipped with the most modern and scientific tools.

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Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

SETTING THE WATER-STRING

Is any production lost by setting the water-string several feet into the oil sand?—S. E. H.

Under certain conditions no loss in production would result if the casing shoe were set several feet into an oil sand, whereas in others a loss in production would take place. Generally there is some reason for setting the casing into an oil sand. To cite some of these, occasionally an effective water shut-off is not obtained in wells where the water-string may be set only a few feet above or at the top of the oil sand, and in order to shut off the upper water it may be necessary to set another water-string, in which event the second string would be set into the sand.

In rotary drilling, unless efficient coring is resorted to, the top of the sand may not be definitely located and the casing is accidentally set into the sand. Frequently the upper part of a sand may contain only gas and in an attempt to increase oil production the casing is set below the gas horizon.

Occasionally a formation is referred to as a certain sand, whereas it actually consists of a number of sands separated by thin but persistent beds of shale.

In most fields the first wells drilled into a sand do not penetrate the entire so-called sand just referred to. The upper strata may be depleted sufficiently to permit edgewater to encroach. If upon making a subsurface study, this condition is found to prevail, the casing is set below the top streak in the "sand."

Assuming that the producing sand is a true sand, that no shale breaks are present in it, that there is no free gas in the upper part of the sand, it is believed that there would be no loss in production if the pipe were set below the top of the sand. However, if gas is present in the top of the sand and again assuming that it is a true sand, the effect of setting the pipe below the top of it would be likely to result with certain production practices in a decreased oil production. If the well were allowed to flow at a maximum, the gas would by-pass the oil and the purpose in settling the pipe below the gas would be defeated.

Assuming that shale breaks are present in the sand, the gas may be cased off to advantage. However, if oil is present in the upper part, the production usually will be decreased. To illustrate, many wells drilled in the Los Angeles Basin fields were inadvertently cased off below the top of the so-called oil zones. The water-string in many of these was perforated later after production from the lower portion of the zone had been greatly depleted.

Wells recompleted by the method just cited often produced several hundred and sometimes as much as 1,500 bbls. per day from the portion of the zone cased off. Your question calls attention to the value of making a thorough study of underground conditions before attempting any departure from the usual practices in completing a well.

PROPORTIONS FOR CONCRETE

Can you suggest a simple way in which to calculate the amount of sand, gravel, and cement needed to make 1 yard of concrete?—O. A. K.

To determine the volume of cement, gravel or broken stone, and sand required to make 1 cubic yard of cement you must first decide on the kind of mix you desire to use. For example, in a 1-2-4 mixture, where 1 represents one part cement, 2 represents two parts sand, and 4 represents four parts gravel or broken stone—

Let c=number of parts of cement.
s=number of parts of sand.
g=number of parts of gravel or broken stone.
C=number of barrels of cement for 1 cu. yd. of concrete.
S=part of a cu. yd. of sand.
G=part of a cu. yd. of gravel or broken rock.

Then,

$$C = \frac{11}{c+s+g}$$

$$S = \frac{3.8}{27} Cs$$

$$G = \frac{3.8}{27} Cg$$

and if the broken stone is of uniformly large size with no smaller pieces of stone in it, the voids will be greater than if the stone is graded. Therefore, 5 per cent must be added to each value found by the preceding formula.

Example: If you intend to use a 1-2-4 mixture, the volume of cement, sand, and gravel or broken rock is determined as follows:

$c = 1$
$s = 2$
$g = 4$

Then

$$C = \frac{11}{1+2+4} = 1.57 \text{ bbls. cement.}$$

Substituting the values of C and s in the formula for S,

$$S = \frac{3.8}{27} \times 1.57 \times 2 = .44 \text{ cu. yds. sand.}$$

Substituting the values of C and g in the formula for G,

$$G = \frac{3.8}{27} \times 1.57 \times 4 = .88 \text{ cu. yds. gravel or broken stone.}$$

When the broken stone used is of uniformly large size as previously described, add 5 per cent to the value found for each constituent.

CHILLED CAST-IRON CUPS

Would you recommend the use of chilled cast-iron cups in a soft-steel pump-barrel? The ordinary type of cups have been wearing out so rapidly and it occurred to me that the chilled cast-iron cups might last longer.—O. B. S.

It would not be good policy to use a cup such as you describe in a soft-steel pump-barrel on account of the greater wear on the pump-barrel. The cost of new liners and replacement would exceed the cost of new cups. It is inferred from your question that you are having pump difficulties which might be attributed to sand, in which event it is suggested that you try out a type of pump that is especially adapted for that purpose.

AS TO OIL IN SOUTHEASTERN STATES

In your issue of December 1, 1927, you published a very interesting article about the staggering losses caused by drilling dry holes. Florida, Georgia and Alabama are listed with 100 per cent failures. Considering the limited amount of exploration work in these three states, do these failures furnish conclusive proof of the lack of oil and gas deposits? Could you advise me of any literature or reports treating the geological conditions as to the possibilities of finding oil in the three states mentioned? I am particularly interested in Florida, where, I understand, exploration work has been going on of late with some kind of success. Any information you may be able to give me will be greatly appreciated.—T. R. L.

Exploration work thus far in Florida, Georgia and Alabama has produced no oil and the field for wildcatting offered by these three states has not appeared to be attractive to the more conservative operators. Many tests have been put down in Florida and some in the two other states, but no successful completion has yet been reported. Failures—even the 100 per cent failures that mark the history of oil-hunting in the three states mentioned—do not prove anything except that in the strata pierced there was no oil at the precise spots where the test wells were drilled. Adventurous men are still willing to invest money in wildcat ventures in the territory referred to. If you will write to the state geologist of each of the states named, addressing him at the state capital, he will give you the information you desire regarding geological conditions.

PULSATION IN GAS LINE

How may the effects of pulsation in a gas line causing vibration in an orifice meter be overcome?—N. F. C.

Installing a gas receiver between the source of the vibration and the meter will dampen pulsation. The gas receiver may consist of a joint or two of large diameter casing or of a small tank. Increasing the distance between the source of vibration and the meter also tends to dampen the effect on the meter. The use of straightening vanes is also recommended. Another method used is to decrease the size of opening for the mercury to travel through in the meter. This tends to slow down the flow of mercury from one side of the meter to the other. For further information on this subject, it is suggested that you get in touch with a representative of one of the meter companies.

HOW TO GET BULLETIN

In your issue of December 22, 1927, under "Determining Sand Porosities," you say, "The method is described in detail in the October issue of the Bulletin of the American Association of Petroleum Geologists." Will you please inform me where I can find this paper or bulletin, or who issues it?—G. G. B.

You may obtain a copy of this bulletin by writing to American Association of Petroleum Geologists, Box 1852, Tulsa, Okla., sending $1.50. Many public libraries have copies of the association bulletin on file. You might be able to borrow one from one of the many members of the association.

MISSING THE OIL SAND

I hear so many conflicting opinions about the advantages and disadvantages of rotary drilling. Is there any danger of drilling through an oil sand without knowing it? I hear this statement made and if it is true, it seems to me that this one thing would outweigh all the advantages the rotary might have.—A.P.G.

Your question indicates that you are a cable tool man. It is true in some wells drilled with the rotary, sands have been drilled through without any evidence appearing at the surface in the drilling mud. Cable tool drilling seemed to have certain advantages in the past, especially when drilling in wildcat territory. However, these have been largely overcome by improvements in rotary equipment and the intelligent use of the core barrel.

DO HOT-WATER PIPES FREEZE FIRST?

Will hot-water pipes freeze more quickly than cold-water pipes, both having the same protection from cold and same exposures as well as same capacity of flow and under same pressure? If so, why and at what difference of temperature? —E. K. S.

Hot water will freeze more quickly than cold water, owing perhaps to the driving off of gases, such as carbon dioxide and air, when heated, making the heated water more dense and consequently easier to freeze. The difference in temperature is very slight and cannot be calculated.

STOPPING LEAKS IN OIL LINE

Do you know of any handy method for stopping leaks in an oil line when the leak is at a collar or a tee?—F. J. P.

One of the supply companies has a leak clamp listed that will accomplish the purpose. It consists of two split rings, one of which is clamped in place on the pipe and held by means of set screws. The other ring is towards the leak, a gasket being placed against the leak. By means of set screws in the first ring, the second ring is forced against the gasket. This device has been successfully used in a number of fields.

TO REMEDY SLIPPING BELT

Is there anything that can be put on a rubber belt without injuring it, to stop slipping?—S. P. M.

Vegetable castor oil or boiled linseed oil will lessen slipping and neither one will injure the belt.

STEEL INDUSTRY STARTS YEAR WELL; ORDERS BETTER THAN A YEAR AGO

By B. E. V. Luty

PITTSBURGH, Pa., Jan. 16.—Appearances in the steel trade are strikingly similar to those at this date last year, and from this fact, seeing what occurred in the early months of last year, favorable prognostications can be made. At the middle of last January the general talk in the trade was that business had been decidedly dull as to new bookings, yet steel mills were running at a better rate than in December. At the time it looked as if trade would be rather dull, but the outcome was that last March, according to the official returns, made a new high record in steel production. It turned out that while there was not much buying in January the mills had entered the year with some accumulation and there was much quiet specifying on contracts, so that after all business was running along quite well, although there was an appearance of dullness.

It is just the same now, in a general way, but with the mills better provided with shipping orders than they were a year ago. All the finished steel markets have appeared dull during the half month, since the turn of the year, but this is a seasonal matter. There was heavy specifying in December on bar, shape and plate contracts, to take advantage of expiring prices, as contracts for the new quarter are at a slight rise, the uniform price on the three products being 1.80 cents. In sheets there was very heavy buying in December, almost unprecedented, and sheet mills are operating at higher prices than for several months, although they are still at much under capacity.

Ingot Production

Production of steel ingots in December as officially reported showed technically a gain of about 1 per cent from the November rate. This was by counting out December 26 only as a holiday, whereas the mills lost somewhat more time than that on account of the holidays, so that in essence production of steel was materially heavier in December than in November. Thus November is left as the low month of 1927, whereas in 1926 December had been the low month. This in itself gave the steel industry a good start for the new year.

Already there are indications that this month's steel production will be between 5 and 10 per cent above that of December, and there are prospects, by reason of activities in the various consuming lines, of increasing demand month by month. There is also the plain precedent that in recent years production has always increased sharply in the early months of the year—in 1923 to April as the peak month, and in the four succeeding years to March as the peak month. Various considerations suggest that this year the movement will be more prolonged, if perhaps slower, to a peak in April or May rather than in March.

The matter of prices interests the steel trade much more at the present time than the matter of tonnage. There has been fairly heavy demand for five successive years, with 1924 rather an off year and 1927 as a slightly off year, but yet with much more steadiness than was ever before seen in steel in a five-year period. Thus it seems out of the question that there should be any slump in steel demand. On the other hand there is virtually no chance of demand increasing in the near future to such an extent as to test productive capacity and thus raise prices automatically.

Seek Better Prices

The mills realize that if they want better prices they will have to get them by their own unaided efforts, and this they seem intent on doing. Pipe prices are not an issue. They slipped last year by 5 per cent on standard pipe and 10 per cent on oil country goods, but previously the level reached in April, 1923, had been held and so pipe prices are by no means unsatisfactory compared with prices in some other lines. In sheets the mills practically failed in their advance, as they are now booked well for the current quarter and even now one can buy at approximately the old prices, so the sheet advance, if it comes, will not be actually effective for some time. In bars, shapes and plates the 1.80-cent price is holding, and it is expected an advance to 1.85 cents will be made within a short time, which would stimulate contracting on quarterly contracts at 1.80 cents.

The Steel corporation's unfilled obligations increased by 518,430 tons during December, making 824,761 tons increase in three months. The gain was due chiefly to seasonal business, the annual rail buying movement having occurred during the quarter, while much tin plate business was entered for the half year and there was a large volume of sheet business. The siginficant thing is that while many months in 1927 appeared poor, the net result of the year was a slight increase in unfilled obligations, 11,905 tons. Appearances almost throughout the year were such that a net decrease for the year would have been expected.

SURVEY FOR GAS LINE AMARILLO TO EL PASO

AMARILLO, Tex., Jan. 14.—Plans for the extension of one of the Panhandle's gas trunk line systems to El Paso, Tex., is the latest of gas developments from that remarkable gas area. West Texas Gas Co., subsidiary of the Prairie Oil & Gas Co., is making a preliminary survey for a 400-mile line through the Pecos Valley of New Mexico to El Paso.

West Texas Gas Co. recently completed a gas line from Panhandle south into the South Plains, a rich agricultural country. At present there are four main line systems going out of the Panhandle. Two run south to the Wichita Falls district, one into the South Plains area and the fourth goes north into Wichita, Kans. A fifth project is being built northwest to Denver, Colo.

UNIVERSITY ROYALTIES WERE LESS IN 1927

AUSTIN, Tex., Jan. 14.—Oil royalties collected and paid into the University of Texas permanent fund for the calendar year 1927, fell more than $200,000 below the total for 1926, which was $2,919,389.

Only the interest from the royalties, derived chiefly from West Texas acreage set aside for the school can be used for current improvements on the campus.

Royalty collections for 1927 were $2,698,904. December, 1927, collections, however, exceeded the corresponding receipts in 1926 by more than $50,000, the total for December last being $252,648.

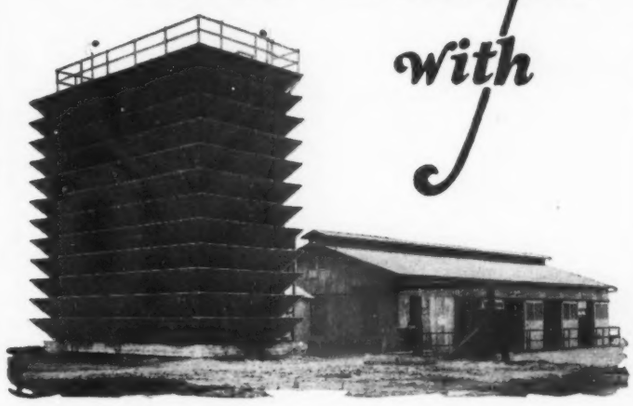
BRECKENRIDGE CLUB TO OPEN

BRECKENRIDGE, Tex., Jan. 14.—The Breckenridge Petroleum Club will be the most conveniently arranged club of its character in West Texas, according to the committee in charge of fitting up the two floors of the Burch Hotel to be occupied. This committee, composed of Claude Thompson, C. A. Davis and M. E. Daniel, has announced it will be ready for use with the opening of the new hotel February 1.

PENN-MEX GETS GOOD PRODUCER

PITTSBURGH, Pa., Jan. 14.—Word was received at the Penn-Mex Fuel Co.'s office that its No. 8 on the Paso Real tract in Mexico has been drilled in and is good for 10,000 bbls. a day. No. 7 on the same tract came in some time ago and was good for 20,000 bbls. a day.

Protect Your Plant with



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FLUOR REDWOOD COOLING TOWERS

MEN KNOWN IN OILDOM

William Reinhardt

William Reinhardt, newly elected vice president of the Shell Company of California, joined that organization as a field engineer at Oilfields, Calif., during the early part of 1917, and continued in the employ of that concern for the greater part of the following four years. In recognition of his ability he was appointed assistant general field superintendent of the Roxana Petroleum Corporation in January, 1921, but his services in the Mid-Continent area were suddenly terminated several months later by a transfer back to California. During his absence the Shell company had started a wildcat up on Signal Hill and the completion of this discovery well during October, 1921, opened up Long Beach, California's most prolific field. The Shell was faced with a prospect of having to cope with an intensive town lot drilling campaign and the company accordingly dispatched a fast wire back to the Roxana for "Bill" Reinhardt, a very efficient and capable field man. He immediately returned to California and in October, 1921, was appointed superintendent at Long Beach and put in charge of all the Shell's drilling operations in that field. During his regime the Shell built up a very substantial production at Long Beach due to the successful completion of a large number of wells and efficient handling after being brought in. Two years later, during the latter part of 1923, Mr. Reinhardt was promoted to assistant general field superintendent with headquarters at the Los Angeles office and became general field superintendent during the early part of 1924. On July 1, 1926, Mr. Reinhardt was made manager of production, replacing William C. McDuffie, who at that time became general manager of production for the entire Royal Dutch interests. Mr. Reinhardt and Mr. McDuffie both worked up from the ranks and their merited promotions during the past several years have been received with considerable pleasure by the entire industry.

PERSONAL PARAGRAPHS

John Leonard has been elected a director of the Omar Oil & Gas Company.

* * *

H. B. Clark has been elected a director of the Beacon Oil Company of Boston, Mass.

* * *

W. G. Mitchell has been appointed assistant to the president of The Texas Company.

* * *

Robert Armitage, of the Smith Separator sales force, is making a trip through Kansas calling upon the trade.

Dr. W. E. Grisso, one of the royalty owners in the Seminole Field, paid a visit to Tulsa, Okla., last week.

* * *

J. S. Harrison, sales manager of the O'Neill Oil Company of Milwaukee, Wis., was a Tulsa, Okla., visitor last week.

* * *

V. S. Swisher, Oil City, Pa., secretary of the Southern Group of Pipe Lines, was a Pittsburgh, Pa., visitor last week.

* * *

J. F. Burgess, Oil City, Pa., chief accountant for the Southern Group of Pipe Lines, was a business visitor in Pittsburgh, last week.

* * *

R. T. Lyons, geologist for the Skelly Oil Company at Tulsa, Okla., visited the company's West Texas headquarters in San Angelo recently.

* * *

W. M. Lourcey, of the Gulf Production Company, Fort Worth, Tex., has returned to his duties following a business trip into West Texas.

* * *

James F. Corcoran, special representative for Trimont Manufacturing Company, Roxbury, Mass., is visiting Texas and Oklahoma fields.

* * *

E. D. Rattray, of the Gibson Oil Corporation, Amarillo, Tex., and Carl S. Aune of the same city, were recent business visitors in West Texas.

* * *

J. L. McMahon, district superintendent of The Texas Company's Wichita Falls, Tex., district operations, is recovering from a recent illness.

* * *

H. E. Clark, of the Laurel Oil & Gas Company, is spending a few weeks in Tulsa, Okla., and will return to his home in Philadelphia, Pa., next month.

* * *

Harold Whealton, of Whealton & Townsend, Inc., Los Angeles, Calif., was in Tulsa, Okla., last week, visiting the Mid-Continent headquarters of his company.

* * *

E. H. Leroux, president of the Oklahoma Pipe Line Company, spent a few days at Dallas, Tex., last week, and is now back at his desk in Muskogee, Okla.

* * *

W. P. Z. German, of the legal department of the Skelly Oil Company, left this week for California where he will spend several weeks in the interest of the company.

* * *

Dan Morris, Windsor, Ontario, representative of B. P. Corey & Son Company, has been appointed sales manager of that firm with headquarters at Petrolia, Ontario.

* * *

Tom P. Williams, of San Angelo, Tex., in charge of the land department in that district for the Roxana Petroleum Corporation, was a Fort Worth, Tex., visitor last week.

* * *

T. M. Magee, Keister, Pa., retired superintendent of the Southwest Pipe Line Company, and his sister, Mrs. Mary Bovard, have gone to Florida to spend the winter.

* * *

Joseph M. Wilson, geologist for the Simms Oil Company at San Angelo, Tex., has returned to that city following a couple of months spent in the main office at Dallas Tex.

* * *

L. L. Lookabaugh, division manager of the Roxana Petroleum Corporation's Wichita Falls, Tex., division, was a recent business visitor at the Dallas, Tex., office of the company.

* * *

John V. McMahon, former president of the Sinclair Oil & Gas Company, paid a visit to Tulsa, Okla., last week, en route to the Pacific Coast. Mr. McMahon now resides in New York.

* * *

H. C. Miller, petroleum engineer of the United States Bureau of Mines, with headquarters at San Francisco, Calif., has returned from a trip through the Eastern and Mid-Continent fields.

* * *

John J. Hill, of the Carter Oil Company's gasoline department, is now in South America observing conditions in his branch of the industry in the interest of the Standard Oil Company of New Jersey. He will return to the United States about April 1.

E. R. Perry, formerly general manager of the Cosden Oil & Gas Company, and now an independent oil producer of Fort Worth, Tex., visited his former home at Tulsa, Okla., last week.

* * *

A. M. Peairs has been in Tulsa, Okla., during the past week. He is now representing Ross Heater & Manufacturing Company, Pittsburgh Piping & Equipment Company, and the Bethlehem Steel Company with offices in the American Exchange Bank Building, Dallas, Tex.

* * *

G. B. Shea, associate petroleum engineer of the United States Bureau of Mines, with headquarters at San Francisco, Calif., has returned to his headquarters after an extended trip through the Mid-Continent and Texas fields in connection with the Bureau's safety division.

* * *

M. Lloyd Freese, vice president of the Altitude Petroleum Company of Tulsa, Okla., was a Fort Worth, Tex., visitor this week, on business connected with West Texas operations in which his company is interested. The Altitude is part owner of the wells being drilled in Pecos County by the Olean Petroleum Company.

* * *

Robert Lee Craycroft, founder, and recently retired as president of the Craycroft Oil Company, will become associated with the Liberty National Bank in the near future. Mr. Craycroft sold his interest in the Craycroft Oil Company to the Beacon Oil Company several months ago. He had been in the oil business for over 25 years.

* * *

O. A. Kommers, president of the Kern County Chamber of Commerce, was recently elected president of the Taft branch of the California Chamber of Mines and Oil. Mr. Kommers, who succeeds John Stevens of the Associated Oil Company, is district manager of the San Joaquin Light & Power Company with offices at Taft, Calif.

* * *

H. A. Beasley, Albuquerque, N. Mex., well known throughout the Mid-Continent and at present operating in the Seven Lakes district of northwest New Mexico, was a recent visitor in the Texas Panhandle. Mr. Beasley was a former mayor of Bartlesville, Okla., and at one time rated among the big 20 of independent producers in Bartlesville.

* * *

R. F. Ley, sales manager of the Oilfield Equipment Company, has returned to New York after spending several days at the plant of the Joseph Reid Gas Engine Company in Oil City, Pa. Mr. Ley went to Oil City following a trip to Chicago and the Southwest. The Oilfield Equipment Company is the export sales representative of the Joseph Reid Gas Engine Company.

* * *

Dr. A. Wade Schwittala, executive vice president of the Roxana corporation, headed a group which inspected the industrial tract on the Houston, Tex., ship channel, and returned to Tulsa, Okla., by air. Others in the party were V. H. Smith, vice president of the North American Car Corporation, and Mrs. Smith, of Tulsa; R. W. Patterson, president of the Gulf State Terminal & Transfer Company, of Dallas, Tex., and T. J. Mullin, president of the Houston-American Petroleum Company.

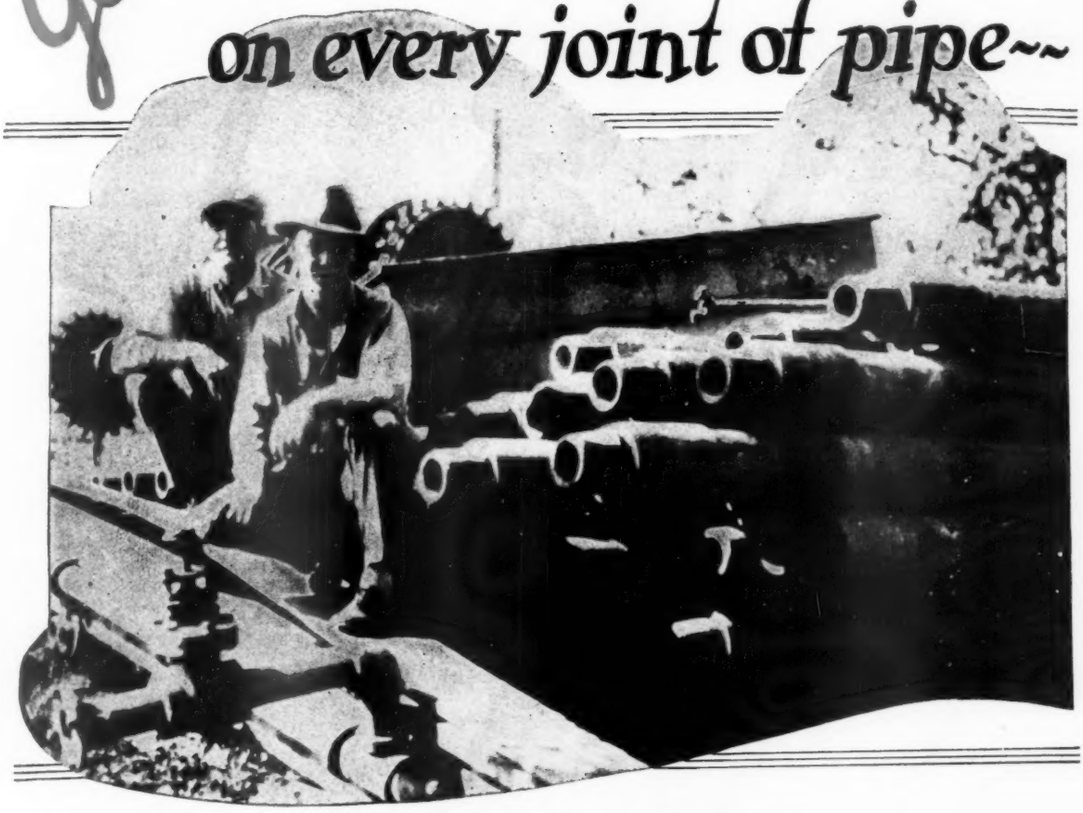
* * *

A. C. Wilkes, pioneer oil man of California and at one time owner of the W. D. Head Drilling Company, has been elected vice president of the Italo-American Petroleum Corporation of California. Mr. Wilkes organized the old Commonwealth Oil Company and later purchased the Western Union Oil Company which properties formed the basis for the organization of the Union Oil Company of Delaware which later sold out its properties to the Shell Union Oil Company.

* * *

A number of New York officials of the Henry L. Doherty Companies were guests of H. R. Straight, general manager of the Empire Companies, and division managers, at the Hillcrest Country Club, at Bartlesville, Okla. They included Frank R. Coates, H. O. Caster, H. D. Freuauff, P. R. Jones, R. G. Griswold, Louis F. Musil of the executive committee; C. E. Weger, secretary of the executive committee, and Ed Korsmeyer. P. M. Miskell of Tulsa, Okla., manager of the refining division, and W. H. Merritt, Tulsa, in charge of the oil marketing department, were hosts with Mr. Straight.

Yes Sir! We use a TOOL JOINT on every joint of pipe~~



The above picture shows a string of 6″

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on the Cudjo lease — Searight field, Seminole, Oklahoma. The men are: Grover Simpson, Field Manager, and Virgil Wulz, Tool Pusher, for Loffland Brothers, Contractors.

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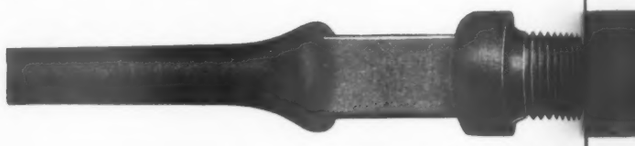

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Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

SETTING THE WATER-STRING

Is any production lost by setting the water-string several feet into the oil sand?—S. E. H.

Under certain conditions no loss in production would result if the casing shoe were set several feet into an oil sand, whereas in others a loss in production would take place. Generally there is some reason for setting the casing into an oil sand. To cite some of these, occasionally an effective water shut-off is not obtained in wells where the water-string may be set only a few feet above or at the top of the oil sand, and in order to shut off the upper water it may be necessary to set another water-string, in which event the second string would be set into the sand.

In rotary drilling, unless efficient coring is resorted to, the top of the sand may not be definitely located and the casing is accidentally set into the sand. Frequently the upper part of a sand may contain only gas and in an attempt to increase oil production the casing is set below the gas horizon.

Occasionally a formation is referred to as a certain sand, whereas it actually consists of a number of sands separated by thin but persistent beds of shale.

In most fields the first wells drilled into a sand do not penetrate the entire so-called sand just referred to. The upper strata may be depleted sufficiently to permit edgewater to encroach. If upon making a subsurface study, this condition is found to prevail, the casing is set below the top streak in the "sand."

Assuming that the producing sand is a true sand, that no shale breaks are present in it, that there is no free gas in the upper part of the sand, it is believed that there would be no loss in production if the pipe were set below the top of the sand. However, if gas is present in the top of the sand and again assuming that it is a true sand, the effect of setting the pipe below the top of it would be likely to result with certain production practices in a decreased oil production. If the well were allowed to flow at a maximum, the gas would by-pass the oil and the purpose in settling the pipe below the gas would be defeated.

Assuming that shale breaks are present in the sand, the gas may be cased off to advantage. However, if oil is present in the upper part, the production usually will be decreased. To illustrate, many wells drilled in the Los Angeles Basin fields were inadvertently cased off below the top of the so-called oil zones. The water-string in many of these was perforated later after production from the lower portion of the zone had been greatly depleted.

Wells recompleted by the method just cited often produced several hundred and sometimes as much as 1,500 bbls. per day from the portion of the zone cased off. Your question calls attention to the value of making a thorough study of underground conditions before attempting any departure from the usual practices in completing a well.

PROPORTIONS FOR CONCRETE

Can you suggest a simple way in which to calculate the amount of sand, gravel, and cement needed to make 1 yard of concrete?—O. A. K.

To determine the volume of cement, gravel or broken stone, and sand required to make 1 cubic yard of cement you must first decide on the kind of mix you desire to use. For example, in a 1-2-4 mixture, where 1 represents one part cement, 2 represents two parts sand, and 4 represents four parts gravel or broken stone—

Let c = number of parts of cement.
s = number of parts of sand.
g = number of parts of gravel or broken stone.
C = number of barrels of cement for 1 cu. yd. of concrete.
S = part of a cu. yd. of sand.
G = part of a cu. yd. of gravel or broken rock.

Then,

$$C = \frac{11}{c+s+g}$$

$$S = \frac{3.8}{27} Cs$$

$$G = \frac{3.8}{27} Cg$$

and if the broken stone is of uniformly large size with no smaller pieces of stone in it, the voids will be greater than if the stone is graded. Therefore, 5 per cent must be added to each value found by the preceding formula.

Example: If you intend to use a 1-2-4 mixture, the volume of cement, sand, and gravel or broken rock is determined as follows:

$$c = 1$$
$$s = 2$$
$$g = 4$$

Then

$$C = \frac{11}{1+2+4} = 1.57 \text{ bbls. cement.}$$

Substituting the values of C and s in the formula for S,

$$S = \frac{3.8}{27} \times 1.57 \times 2 = .44 \text{ cu. yds. sand.}$$

Substituting the values of C and g in the formula for G,

$$G = \frac{3.8}{27} \times 1.57 \times 4 = .88 \text{ cu. yds. gravel or broken stone.}$$

When the broken stone used is of uniformly large size as previously described, add 5 per cent to the value found for each constituent.

CHILLED CAST-IRON CUPS

Would you recommend the use of chilled cast-iron cups in a soft-steel pump-barrel? The ordinary type of cups have been wearing out so rapidly and it occurred to me that the chilled cast-iron cups might last longer.—O. B. S.

It would not be good policy to use a cup such as you describe in a soft-steel pump-barrel on account of the greater wear on the pump-barrel. The cost of new liners and replacement would exceed the cost of new cups. It is inferred from your question that you are having pump difficulties which might be attributed to sand, in which event it is suggested that you try out a type of pump that is especially adapted for that purpose.

AS TO OIL IN SOUTHEASTERN STATES

In your issue of December 1, 1927, you published a very interesting article about the staggering losses caused by drilling dry holes. Florida, Georgia and Alabama are listed with 100 per cent failures. Considering the limited amount of exploration work in these three states, do these failures furnish conclusive proof of the lack of oil and gas deposits? Could you advise me of any literature or reports treating the geological conditions as to the possibilities of finding oil in the three states mentioned? I am particularly interested in Florida, where, I understand, exploration work has been going on of late with some kind of success. Any information you may be able to give me will be greatly appreciated.—T. R. L.

Exploration work thus far in Florida, Georgia and Alabama has produced no oil and the field for wildcatting offered by these three states has not appeared to be attractive to the more conservative operators. Many tests have been put down in Florida and some in the two other states, but no successful completion has yet been reported. Failures—even the 100 per cent failures that mark the history of oil-hunting in the three states mentioned—do not prove anything except that in the strata pierced there was no oil at the precise spots where the test wells were drilled. Adventurous men are still willing to invest money in wildcat ventures in the territory referred to. If you will write to the state geologist of each of the states named, addressing him at the state capital, he will give you the information you desire regarding geological conditions.

PULSATION IN GAS LINE

How may the effects of pulsation in a gas line causing vibration in an orifice meter be overcome?—N. F. C.

Installing a gas receiver between the source of the vibration and the meter will dampen pulsation. The gas receiver may consist of a joint or two of large diameter casing or of a small tank. Increasing the distance between the source of vibration and the meter also tends to dampen the effect on the meter. The use of straightening vanes is also recommended. Another method used is to decrease the size of opening for the mercury to travel through in the meter. This tends to slow down the flow of mercury from one side of the meter to the other. For further information on this subject, it is suggested that you get in touch with a representative of one of the meter companies.

HOW TO GET BULLETIN

In your issue of December 22, 1927, under "Determining Sand Porosities," you say, "The method is described in detail in the October issue of the Bulletin of the American Association of Petroleum Geologists." Will you please inform me where I can find this paper or bulletin, or who issues it?—G. G. B.

You may obtain a copy of this bulletin by writing to American Association of Petroleum Geologists, Box 1852, Tulsa, Okla., sending $1.50. Many public libraries have copies of the association bulletin on file. You might be able to borrow one from one of the many members of the association.

MISSING THE OIL SAND

I hear so many conflicting opinions about the advantages and disadvantages of rotary drilling. Is there any danger of drilling through an oil sand without knowing it? I hear this statement made and if it is true, it seems to me that this one thing would outweigh all the advantages the rotary might have.—A.P.G.

Your question indicates that you are a cable tool man. It is true in some wells drilled with the rotary, sands have been drilled through without any evidence appearing at the surface in the drilling mud. Cable tool drilling seemed to have certain advantages in the past, especially when drilling in wildcat territory. However, these have been largely overcome by improvements in rotary equipment and the intelligent use of the core barrel.

DO HOT-WATER PIPES FREEZE FIRST?

Will hot-water pipes freeze more quickly than cold-water pipes, both having the same protection from cold and same exposures as well as same capacity of flow and under same pressure? If so, why, and at what difference of temperature? —E. K. S.

Hot water will freeze more quickly than cold water, owing perhaps to the driving off of gases, such as carbon dioxide and air, when heated, making the heated water more dense and consequently easier to freeze. The difference in temperature is very slight and cannot be calculated.

STOPPING LEAKS IN OIL LINE

Do you know of any handy method for stopping leaks in an oil line when the leak is at a collar or a tee?—F. J. P.

One of the supply companies has a leak clamp listed that will accomplish the purpose. It consists of two split rings, one of which is clamped in place on the pipe and held by means of set screws. The other ring is towards the leak, a gasket being placed against the leak. By means of set screws in the first ring, the second ring is forced against the gasket. This device has been successfully used in a number of fields.

TO REMEDY SLIPPING BELT

Is there anything that can be put on a rubber belt without injuring it, to stop slipping?—S. P. M.

Vegetable castor oil or boiled linseed oil will lessen slipping and neither one will injure the belt.

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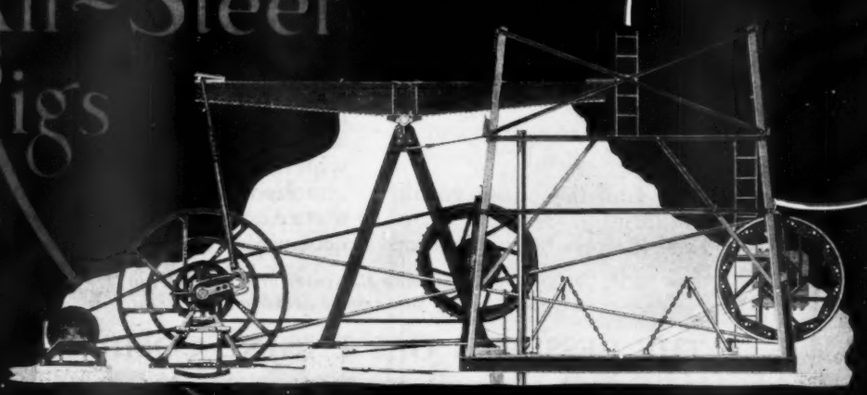
HAS SERVED THE OIL FIELDS OF THE WORLD FOR THIRTY-ONE YEARS

All-Steel Rigs



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Serving more efficiently and for a greater length of time; Parkersburg All-Steel Rigs bring you definite economies that lower your drilling and pumping costs.

These rigs have strength because they are constructed of steel and designed for the heaviest of loads. The steel is protected against corrosion by Aluminum Paint—the metallic coating that defies the elements.

Easy to erect, portable, enduring, and safeguarded against fire hazards, Parkersburg All-Steel Rigs are preferred by exacting buyers of oil well equipment.

Backed by Thirty-One Year's experience in the manufacture of drilling equipment, these *all-steel* rigs represent the work of the most modern machinery and a skilled personnel. The recognized high standard of Parkersburg Quality is consistently and uniformly maintained.

There's a feeling of security in Parkersburg Quality and Service that prevails in every oil producing country of the world.

For complete information on Parkersburg All-Steel Rigs, write for Section "E"—Catalog 26

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Chain Driven Sand Reels & Bailing Reels ■	Portable Drilling Machines (Wood & All-Steel) ■
Steel Wheels ■	Bolted Steel Tanks ■
All-Steel Standard Rigs ■	Miscellaneous Drilling Equipment ■

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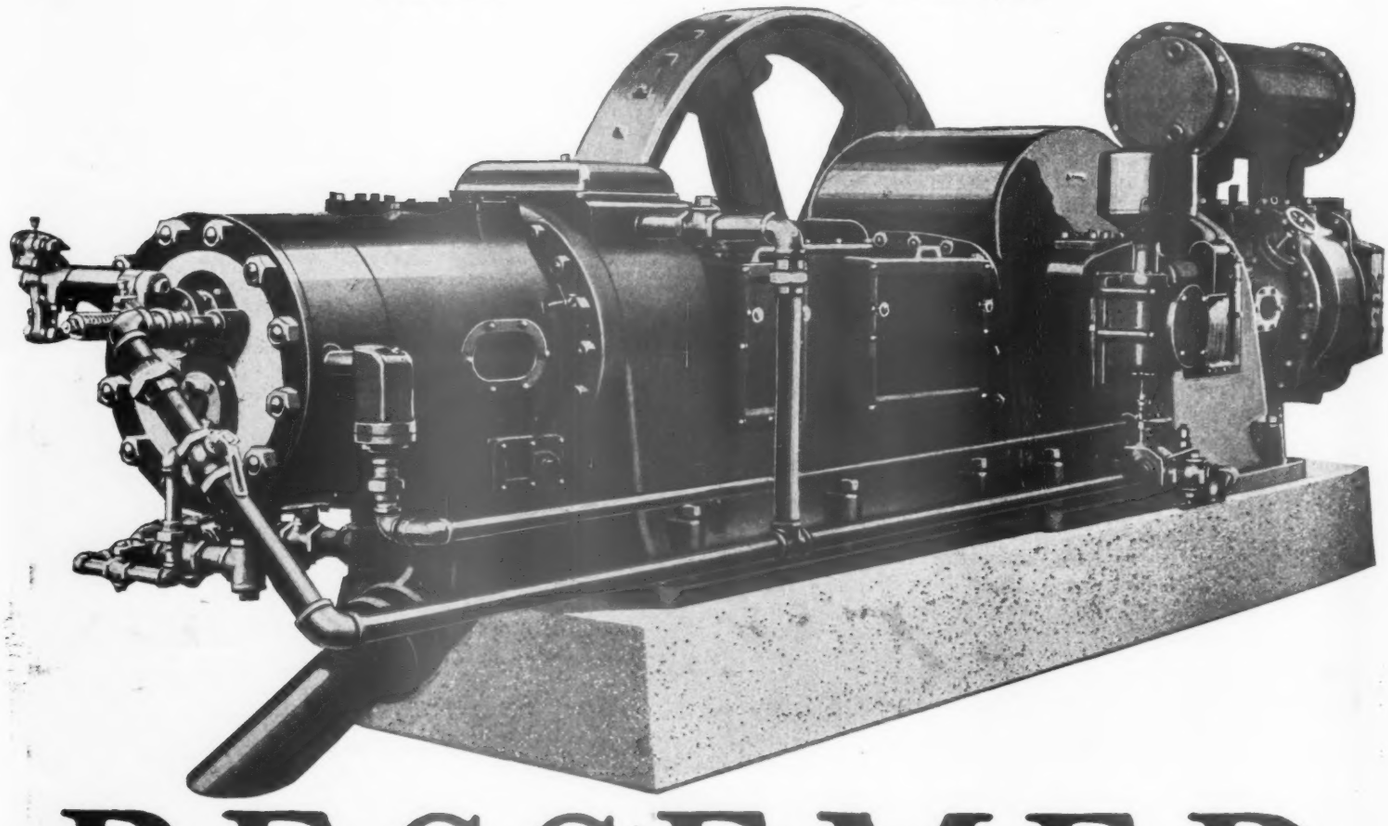

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BESSEMER OIL FIELD ENGINES – COMPRESSORS VACUUM PUMPS – ROLLER PUMPING POWERS

STEEL INDUSTRY STARTS YEAR WELL; ORDERS BETTER THAN A YEAR AGO

By B. E. V. Luty

PITTSBURGH, Pa., Jan. 16.—Appearances in the steel trade are strikingly similar to those at this date last year, and from this fact, seeing what occurred in the early months of last year, favorable prognostications can be made. At the middle of last January the general talk in the trade was that business had been decidedly dull as to new bookings, yet steel mills were running at a better rate than in December. At the time it looked as if trade would be rather dull, but the outcome was that last March, according to the official returns, made a new high record in steel production. It turned out that while there was not much buying in January the mills had entered the year with some accumulation and there was much quiet specifying on contracts, so that after all business was running along quite well, although there was an appearance of dullness.

It is just the same now, in a general way, but with the mills better provided with shipping orders than they were a year ago. All the finished steel markets have appeared dull during the half month, since the turn of the year, but this is a seasonal matter. There was heavy specifying in December on bar, shape and plate contracts, to take advantage of expiring prices, as contracts for the new quarter are at a slight rise, the uniform price on the three products being 1.80 cents. In sheets there was very heavy buying in December, almost unprecedented, and sheet mills are operating at higher prices than for several months, although they are still at much under capacity.

Ingot Production

Production of steel ingots in December as officially reported showed technically a gain of about 1 per cent from the November rate. This was by counting out December 26 only as a holiday, whereas the mills lost somewhat more time than that on account of the holidays, so that in essence production of steel was materially heavier in December than in November. Thus November is left as the low month of 1927, whereas in 1926 December had been the low month. This in itself gave the steel industry a good start for the new year.

Already there are indications that this month's steel production will be between 5 and 10 per cent above that of December, and there are prospects, by reason of activities in the various consuming lines, of increasing demand month by month. There is also the plain precedent that in recent years production has always increased sharply in the early months of the year—in 1923 to April as the peak month, and in the four succeeding years to March as the peak month. Various considerations suggest that this year the movement will be more prolonged, if perhaps slower, to a peak in April or May rather than in March.

The matter of prices interests the steel trade much more at the present time than the matter of tonnage. There has been fairly heavy demand for five successive years, with 1924 rather an off year and 1927 as a slightly off year, but yet with much more steadiness than was ever before seen in steel in a five-year period. Thus it seems out of the question that there should be any slump in steel demand. On the other hand there is virtually no chance of demand increasing in the near future to such an extent as to test productive capacity and thus raise prices automatically.

Seek Better Prices

The mills realize that if they want better prices they will have to get them by their own unaided efforts, and this they seem intent on doing. Pipe prices are not an issue. They slipped last year by 5 per cent on standard pipe and 10 per cent on oil country goods, but previously the level reached in April, 1923, had been held and so pipe prices are by no means unsatisfactory compared with prices in some other lines. In sheets the mills practically failed in their advance, as they are now booked well for the current quarter and even now one can buy at approximately the old prices, so the sheet advance, if it comes, will not be actually effective for some time. In bars, shapes and plates the 1.80-cent price is holding, and it is expected an advance to 1.85 cents will be made within a short time, which would stimulate contracting on quarterly contracts at 1.80 cents.

The Steel corporation's unfilled obligations increased by 518,430 tons during December, making 824,761 tons increase in three months. The gain was due chiefly to seasonal business, the annual rail buying movement having occurred during the quarter, while much tin plate business was entered for the half year and there was a large volume of sheet business. The siginficant thing is that while many months in 1927 appeared poor, the net result of the year was a slight increase in unfilled obligations, 11,905 tons. Appearances almost throughout the year were such that a net decrease for the year would have been expected.

SURVEY FOR GAS LINE AMARILLO TO EL PASO

AMARILLO, Tex., Jan. 14. — Plans for the extension of one of the Panhandle's gas trunk line systems to El Paso, Tex., is the latest of gas developments from that remarkable gas area. West Texas Gas Co., subsidiary of the Prairie Oil & Gas Co., is making a preliminary survey for a 400-mile line through the Pecos Valley of New Mexico to El Paso.

West Texas Gas Co. recently completed a gas line from Panhandle south into the South Plains, a rich agricultural country. At present there are four main line systems going out of the Panhandle. Two run south to the Wichita Falls district, one into the South Plains area and the fourth goes north into Wichita, Kans. A fifth project is being built northwest to Denver, Colo.

UNIVERSITY ROYALTIES WERE LESS IN 1927

AUSTIN, Tex., Jan. 14.—Oil royalties collected and paid into the University of Texas permanent fund for the calendar year 1927, fell more than $200,000 below the total for 1926, which was $2,919,389.

Only the interest from the royalties, derived chiefly from West Texas acreage set aside for the school can be used for current improvements on the campus.

Royalty collections for 1927 were $2,698,904. December, 1927, collections, however, exceeded the corresponding receipts in 1926 by more than $50,000, the total for December last being $252,648.

BRECKENRIDGE CLUB TO OPEN

BRECKENRIDGE, Tex., Jan. 14. — The Breckenridge Petroleum Club will be the most conveniently arranged club of its character in West Texas, according to the committee in charge of fitting up the two floors of the Burch Hotel to be occupied. This committee, composed of Claude Thompson, C. A. Davis and M. E. Daniel, has announced it will be ready for use with the opening of the new hotel February 1.

PENN-MEX GETS GOOD PRODUCER

PITTSBURGH, Pa., Jan. 14.—Word was received at the Penn-Mex Fuel Co.'s office that its No. 8 on the Paso Real tract in Mexico has been drilled in and is good for 10,000 bbls. a day. No. 7 on the same tract came in some time ago and was good for 20,000 bbls. a day.

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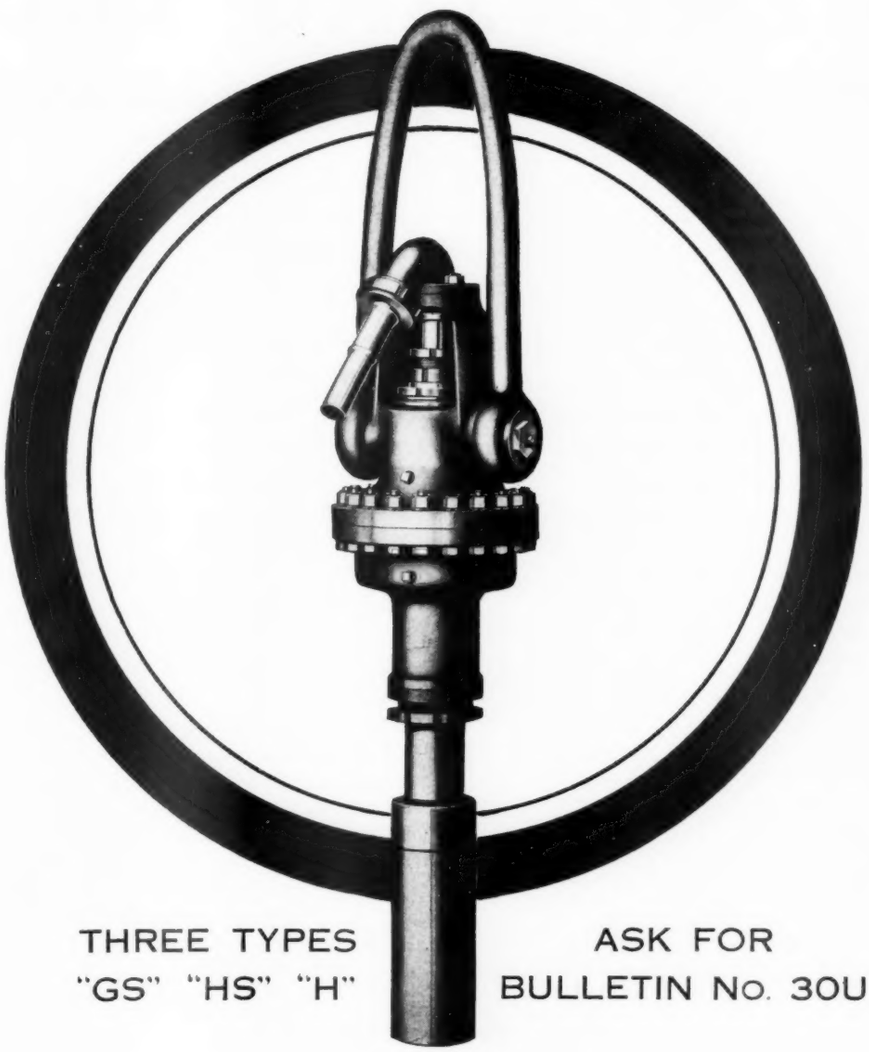

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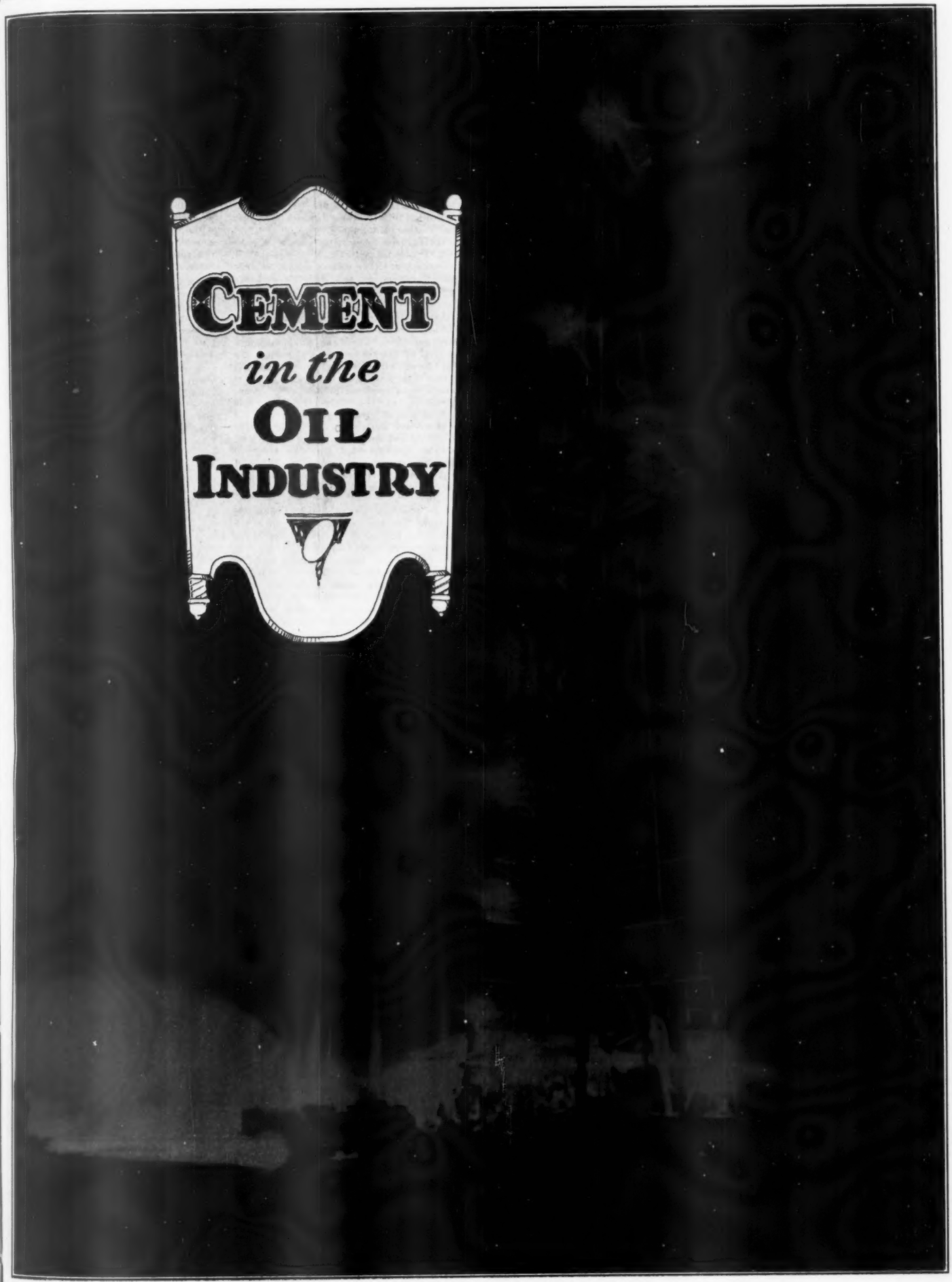

CEMENT
in the
OIL
INDUSTRY

Concrete in the Petroleum Industry

Its Uses Varied From Derrick Foundations Through All Stages of Production, Storage and Refining

By John F. Hough, C. E.
Structural and Technical Bureau, Portland Cement Association.

The petroleum industry uses great quantities of portland cement. This material finds its first use in the making of concrete derrick foundations. From this point on, through all the stages of production, storage and refining, portland cement serves for many purposes.

Mixed with water in the form of a neat grout, portland cement has proven to be the most satisfactory material for forming an impervious wall or packer between the casing and the sides of the hole. This serves a twofold purpose; first, to hold the water string permanently in place; and second to prevent the migration of underground water from its normal abode to sands containing gas and oil.

Concrete plays an important part in forming rigid bases for compressor plants, gas eliminators and casinghead gas machinery.

In storage fields, earthern reservoirs lined with an impervious coating of concrete or gunite, have eliminated great losses from seepage. Circular tanks up to 2,300,000-gallon capacity, constructed throughout of reinforced concrete are particularly adaptable in locations where permanency is desirable. A concrete tank with a concrete dome top cuts down evaporation by heat in the summer time, and the natural insulation afforded by this material maintains good viscosity of the contents in cold weather. The air tightness of the concrete tank also prevents the escape of explosive or inflammable gases and offers good protection against induced lightning voltages.

Concrete roadways offer great financial saving, especially in boom fields where the feverish activity of construction work and drilling operations suffer many hindrances when served by earth or gravel roads.

In refineries, the fireproofness of concrete precludes the consideration of materials not heat resisting in their elements. Office buildings, chemical laboratories, foundations for stills, agitators, wax plants, treaters, storage tanks, filters, separators, sewers, fire walls, electrical conduits, loading racks, stacks, and many other structures and apparatus involve the use of concrete, either for the entire structure or some of its essential parts.

Concrete products are widely used throughout the industry. Roofing materials, concrete pipe, cribbing for retaining fill, block, tile and brick, stucco, trimstone and fence posts are a few of the more common products in general use.

In the paragraphs which follow, facts regarding the making of concrete are presented, following by a detailed description of the particular uses found for this material, both in the production fields and refineries.

Design of Concrete Mixtures

Concrete is a mixture of cement, water and inert materials, put in place in a plastic condition, but hardening soon after through the chemical change known as hydration of the cement. Each ingredient has an important effect on the quality of the concrete. Thorough knowledge of these materials makes it practicable to design mixtures having the desired quality and strength. Methods of control have been devised which permit the maintenance of a uniform standard of quality.

The first consideration should be the proportioning of the several ingredients. The selection of a proper concrete mixture for any given purpose involves a choice of materials and their porportioning to produce concrete of the required properties with the greatest economy. Exhaustive laboratory tests and field experience have proved that for plastic, workable mixes, containing aggregates that are clean and structurally sound, and water that is clean and free from injurious matter, the strength of concrete is definitely fixed by the ratio of the volume of mixing water to the volume of the cement.

Water-Cement Ratio

The principle thus established is called the water-cement ratio law, and is expressed as follows:

For given materials and conditions of manipulation, the strength of concrete is determined solely by the ratio of the volume of mixing water to the volume of cement, so long as the mixture is plastic and workable.

Concrete loading rack in refinery of Roxana Petroleum Corp., Wood River, Ill.

Experiments have shown that other desirable properties of concrete are affected by the amount of water used in mixing in the same way as the strength. Water tightness is especially dependent upon the quantity of mixing water. This is more readily understood by the conception of the cement paste as the medium binding the aggregate together.

Investigations have shown that the compressive strength, as determined by the water-cement ratio law, controls such other desirable properties as high flexural strength, resistance to wear, the bond with reinforcement, and impermeability.

Old methods of proportioning mixtures frequently, but not always, produced concrete of excellent quality. Recently developed methods based on the water-cement ratio law, afford more perfect control with a consequent greater uniformity of results. These methods consist of selecting the water-cement ratio corresponding to the strength desired and finding the most suitable combination of aggregates which will give the necessary workability when mixed with cement and water in this ratio.

Preparing Specifications

One method of specifying the class of concrete desired is to express directly the number of gallons of water to be used with each sack of cement. This type of specification is the simplest and most efficient that can be written. As long as concrete is made of water and cement in the specified ratio and produced in a workable mass, adjustments made in the quantities of aggregates will not affect the resulting quality and strength. Workability is the controlling factor, and is attained by adding or deducting fine or coarse aggregate until the resulting mass can be worked readily into the corners and angles of forms and around reinforcement without excessive spading.

Materials for Concrete

Cement and Water—Careful consideration should be given to the ingredients of concrete. Cement should conform to the standard specifications (serial designation C9-26) of the American Society for Testing Materials.

Water used for mixing should be pure and clean; in general, it should be fit for drinking. Other waters should be used only if experience and tests have shown them to be satisfactory.

Aggregates

Aggregates are inert materials which are mixed with cement and water to produce concrete. They are commonly designated by the terms fine and coarse, the fine being all material passing a one-fourth inch sieve, and the coarse that retained on a one-fourth inch sieve. Consideration of the properties of these materials is of great importance.

There are individual cases where conditions of exposure or use are severe and especial consideration must be given to the chemical as well as the physical properties of aggregates—for instance, where concrete is used in a fire hazardous location.

For the ordinary structural uses of concrete, the ordinary specifications for aggregate will suffice. Fine aggregate should consist of natural sand, or screenings from hard, tough, crushed rock or pebbles, clean and free from any surface film or coating, and preferably well graded from fine to coarse. Coarse aggregate should consist of clean, durable crushed rock, slag or pebbles practically free from soft, flat or elongated particles, well graded and of a size best suited to the type of structure involved. Both fine and coarse aggregates should be free from vegetable or other organic matter.

In its original state, bank or pit-run aggregate is extremely variable as regards grading, silt content and organic impurities, and for these reasons its use is not recommended.

Mixing Concrete

The most satisfactory way to mix concrete is with a mechanical mixer. For ordinary purposes one full minute of mixing will suffice, but for work which must be water tight a minimum of one and a half minutes should be required. Mixing time is figured from the moment that all materials, including the water, are in the drum of the mixer until dumping starts.

All materials going into the mix should be carefully measured so as to maintain the specified amounts. Exceptional care should be exercised in measuring the water, and in no case should the number of gallons per sack of cement specified be exceeded. It must be remembered that with all other ingredients being as they should, the strength or quality of the concrete is absolutely dependent on the amount of mixing water.

This is readily understood when the cement and water in the mixture are thought of as forming a glue that binds the aggregates together. If more water is used than is necessary to make the glue workable, it only serves to dilute or weaken the glue and reduce its strength.

Particularly in oil fields, concrete frequently must be mixed by hand. It should be done in a water-tight trough or on a tight platform. The most uniform mixing will be obtained if the fine aggregate is first spread out on the platform, followed by the cement and coarse aggregate, and the whole mass turned over three or four times before the carefully measured water is added a little at a time. Hand mixing should continue until the mass is of uniform color throughout and all stones are well coated with mortar.

Placing Concrete

After being carefully mixed, concrete should be placed in the forms with equal care, so as to prevent segregation of the ingredients. As it is being placed it should be puddled or spaded with suitable tools in thin layers of 8 or 10 inches until the forms are completely filled. If this is not done, the concrete is likely to contain air pockets and voids called honeycombing which naturally reduce its strength and resistance to certain types of exposure.

Removal of Laitance

When concrete is placed to any considerable depth, spading combined with excess of water will usually cause fine materials, dirt and scum to rise to the surface. This solidifies in a soapy layer and is called laitance. It has little if any strength and should be scraped off as soon as the concrete has stiffened. If left in place it will disintegrate and leave a weak spot in the structure. Water goes through laitance planes quite readily.

A thick layer of laitance is evidence of gross excess of water. In such cases the accumulation of water at the top results in a porous concrete in the portions just below the laitance. The practice which

(Continued on Page 85)

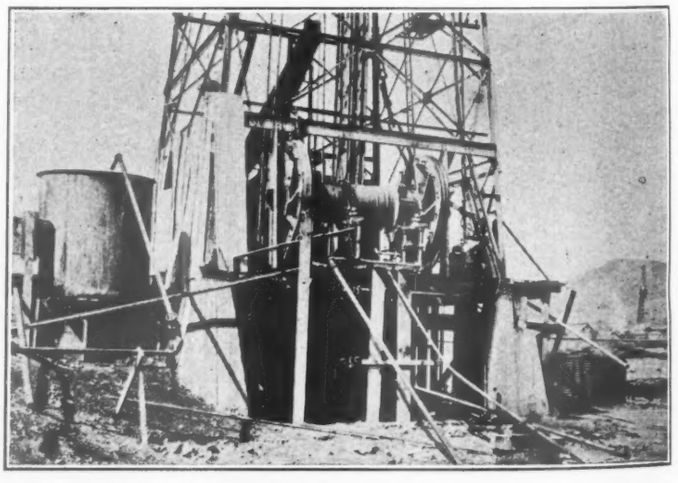


Fig. 2—Edison No. 10 Ventura Avenue Field. Derrick corner, Sampson post and combination rig are on 26-inch concrete piles imbedded 26 feet.

Use of Concrete in Oil Refineries

Fire Prevention Important Consideration in Selection of Material. Class of Construction Required Explained

In a refining plant the first consideration in any construction is fire protection. The best fire protection is fire prevention, and fire prevention can be secured in no better way than by the use of concrete. Composed in itself of noncombustible materials, concrete cannot burn.

In the case of administrative and other buildings constructed of properly made reinforced concrete, serious loss by fire is unlikely. From fires originating within, contents of buildings may, of course, be damaged or destroyed but records of big fires have shown that even when such contents are of highly inflammable character, the injury sustained by concrete buildings is smaller and their salvage value higher than for buildings of any other type.

In refinery construction there are many structures that are in danger of frequent exposure to sudden, very hot and prolonged fires, as for example, supports for stills, and structures in their immediate vicinity. In designing concrete for construction in this class, it is necessary to pay special attention to the selection of aggregates available, and to make a selection that will assure the use of the most resistive type.

In 1921, the United States Bureau of Standards in conjunction with the National Board of Fire Underwriters conducted an extensive series of tests to ascertain the ultimate resistance against fire of many building materials, including reinforced concrete, and other materials encased in concrete. These materials were made into columns and subjected under normal working load to fire exposure increasing in intensity according to a predetermined time-temperature relation until failure, or until the end of eight hours when additional load was applied up to the limit of the furnace equipment.

Considerable difference in fire effects on different concrete columns was noted; this difference was determined as due in a large part to difference in mineral composition of the aggregates used. Quartz, chert, or granite induced spalling and cracking of the crncrete when subjected to the excessive long applied heat of fire tests, while that made with calcareous aggregates, such as limestone, or calcareous gravel showed little effects even from very severe fires. Trap rock or blast furnace slag showed effects intermediate between those above indicated.

From the results of these tests it is apparent that for the class of work required in certain refinery structures, limestone or calcareous gravel would be the best aggregate to use. In localities where the better materials are not available, the recommended practice is to increase the thickness of the protective covering on the outside of all reinforcement.

In the fire tests just described the protective covering was in all cases at least 2 inches on the outside of the steel. The Joint Committee on Standard Specifications for Concrete and Reinforced Concrete recommends that:

"Metal reinforcement in fire resistive construction shall be protected by not less than 1 inch of concrete in slabs and walls and not less than 2 inches in beams, girders and columns, provided aggregate showing an expansion not materially greater than that of limestone or traprock is used; when impracticable to obtain aggregate of this grade, the protective covering shall be 1 inch thicker and shall be reinforced with metal mesh having openings not exceeding 3 inches placed 1 inch from the finished surface."

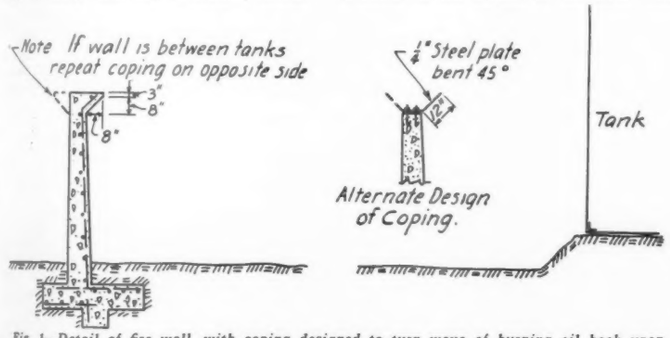


Fig. 1—Detail of fire wall, with coping designed to turn wave of burning oil back upon itself and prevent fire from spreading to adjoining enclosure.

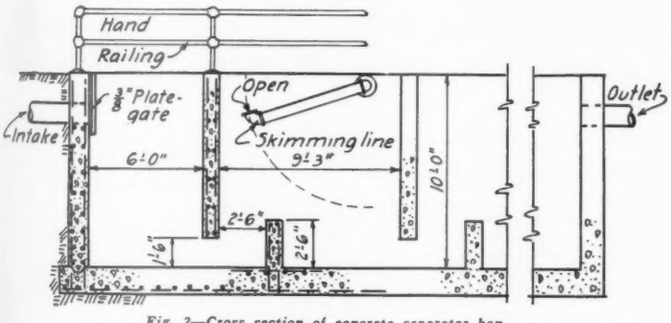


Fig. 2—Cross section of concrete separator box.

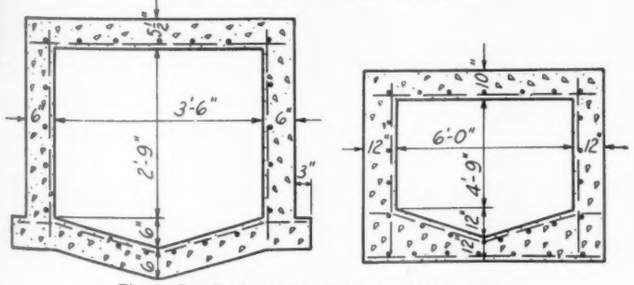


Fig. 3—Detail of concrete sewers for refinery yards.

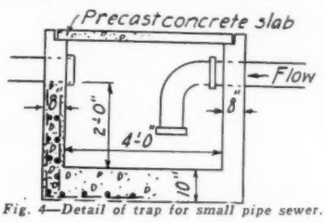


Fig. 4—Detail of trap for small pipe sewer.

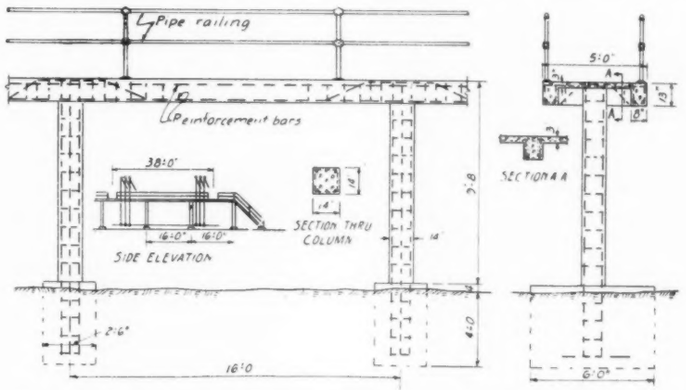
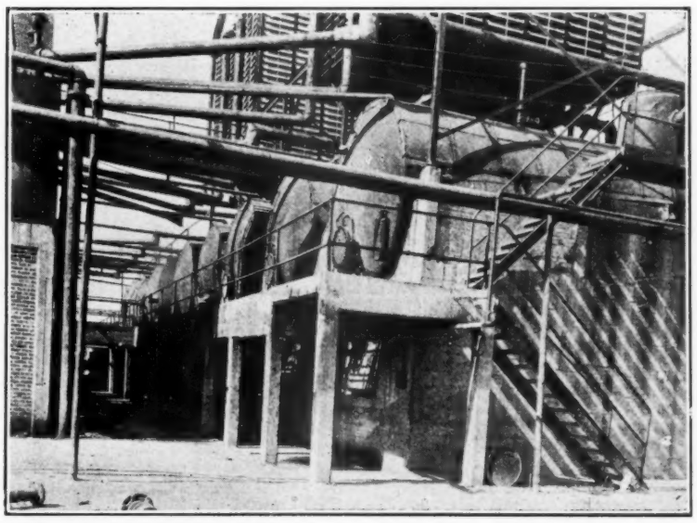


Fig. 5—Detail of concrete loading rack. This rack can be economically constructed and if properly made will last the life of the plant with no upkeep.



Concrete foundations for a battery of stills in the Oklahoma Producing & Refining Co., Muskogee, Okla.

Special Uses—Fire Walls

Crude petroleums and refined oils contained in storage tanks, if ignited, are likely to boil over while burning. In order to make the storage of these products safe, it is necessary to surround the container with so-called fire walls. The primary function of these structures is a hydraulic one, in that they must withstand the wave of oil thrown out by the "boil-over."

Fire walls also act to prevent the possible spread of burning oil. The should be of such dimensions and design, that they will not be overstopped by the sudden wave-like advance of the oil which is boiled out. Aside from this requirement, the fire walls need not, in general, be able to withstand much static pressure. Boil-overs do not as a rule discharge any large part of a tank's contents; and although occasional tank leaks occur, the complete collapse of a full tank is so rare as to justify the designer in neglecting the possibility. Fire-protective legislation and insurance requirements have considered only the capacity of the enclosure and the material of which it is built. As regards capacity, the chief specification usually is that 150 per cent of the tank contents be provided for.

The earthen dykes that are sometimes used offer many objections. They require constant attention due to continual washing down by rains. Built usually 4 feet wide at the top, and with their sides sloping 1 on 1½, they take up considerable area in a storage yard and require unnecessarily wide spacing of tanks. Their greatest disadvantage is that when called upon to function, they naturally

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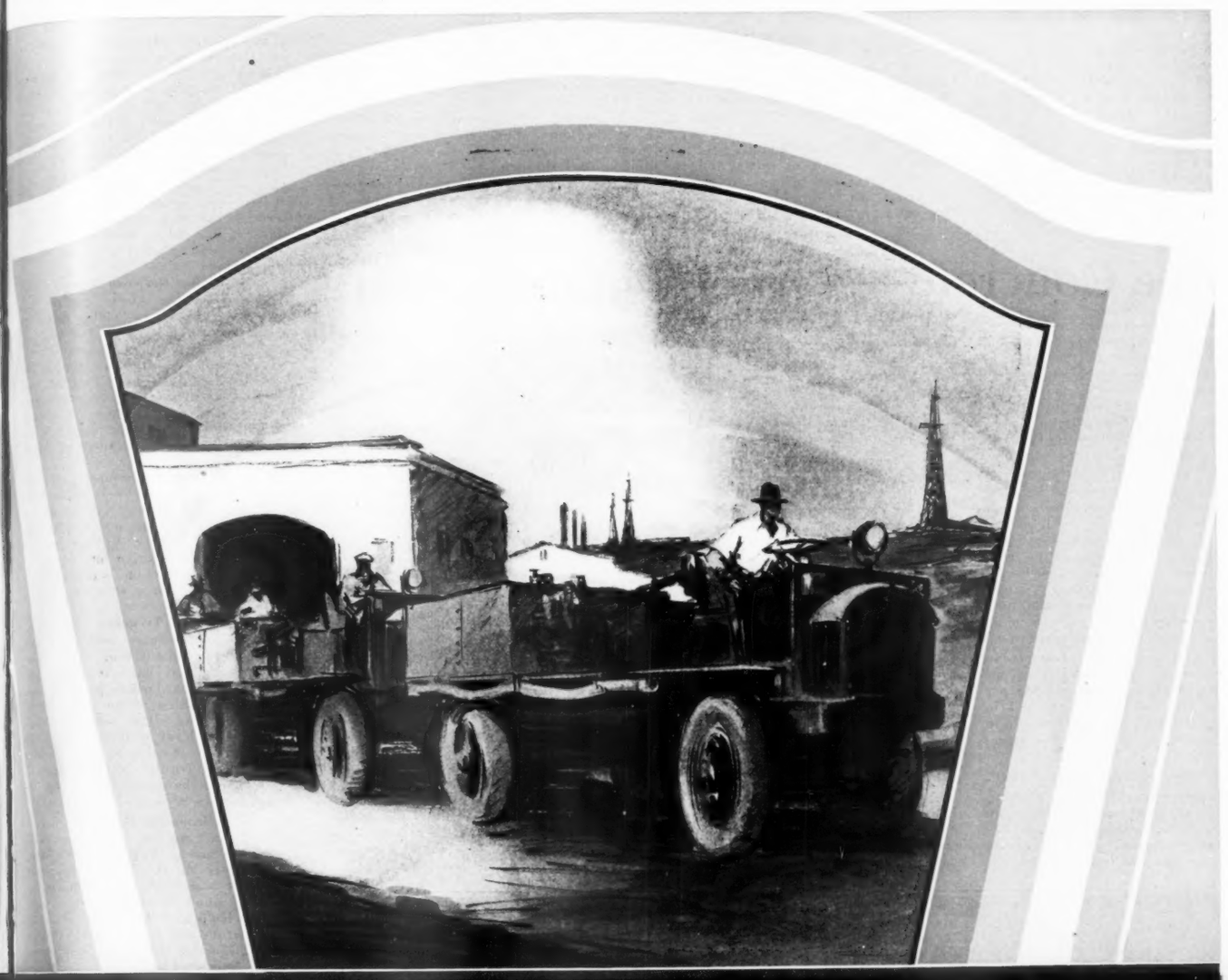

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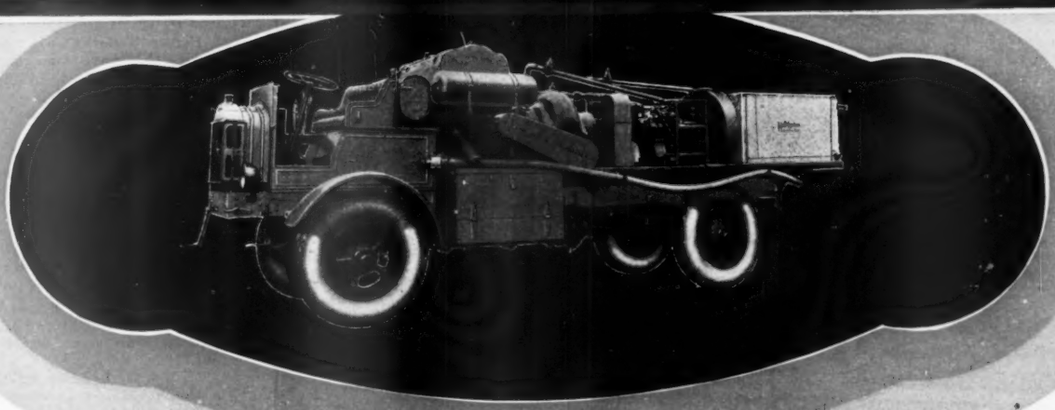

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offer no means of turning the wave of suddenly onrushing oil back upon itself, and unless the dyke is very high the oil will slop over into the next enclosure, thus defeating the purpose of the "fire wall." Copings of various materials can be constructed on top of the dykes, but these are usually at best only temporary affairs due to the rotting or corrosion of their parts.

In regard to the coping required to turn the oil wave back upon itself, the Standard Oil Co. of California in 1924 undertook a series of tests with a view to clearing up the general question of fire wall design. As a result of these tests a coping was designed that would most effectively accomplish the purpose desired. Figure 1 illustrates two types of concrete walls that proved most effective. A complete discussion of the tests referred to above can be found in the "Transactions of the American Society of Civil Engineers for 1926," pages 225 to 258.

Electrical Conduits

Due consideration of safety and economy has led many refiners to place all electric wiring about their plants, underground in concrete conduits. The hazard involved in both high and low tension electrical wires when strung in the air on poles is obviously extremely high in refinery yards.

Concrete as a duct material offers the least possible frictional resistance to the passage of lead or rubber insulated cables, which require a smooth interior surface of conduit, with no appreciable offsets at the joints which would tend to shave off the protective covering as the cable is pulled through.

Concrete has the essential characteristics of effectively resisting the passage of electrical arcs. There is no duct material that will prevent "burn-outs" in the cable itself, but concrete ducts will prevent the communication of this burn out to cables in adjoining lines, and to combustible structures through which the ducts may pass. About a refinery this is of the utmost importance. Short circuits or burn outs will at times happen. Ducts of some materials readily melt when exposed to electrical arcs. Concrete successfully resists the action of heat as no other material will.

Concrete ducts can be obtained in precast sections, or may be mixed and placed on the site, using fiber ducts as molds. If the latter method is used, a minimum spacing of 1½ inches should be maintained between the ducts.

Bases for Railroad Tracks

To eliminate the upkeep cost of spur tracks, especially along loading racks, the use of concrete as a base for the rails is proving an economy in many refineries. There is an inevitable spilling and waste incident to the filling of tank cars, and a concrete base under the rails serves the additional purpose of reclaiming this waste. A slight invert in the center of the tracks, graded to drains, meets this requirement.

In cases where a complete concrete base for rails is not used, drain boxes of concrete may be constructed directly under the filling points which will catch the overflow or ther spillings. These drain boxes are effective but do not offer the more numerous advantages involved in the use of a concrete base for the tracks.

Pipe Trenches

Many refineries have adopted a scheme of placing their main pipe lines in concrete troughs that have removable precast slab coverings, which give ready access to any portion of the pipes for repairs or tapping. The tops of these troughs make ideal walkways about the plant. With the bottom of these trenches drained at regular intervals, any oil spilled during the opening of a pipe line can be readily reclaimed.

Separator Boxes

Water reaching the sewers carries oil in all its various stages of refinement. The recovery of this oil is important, not only from a financial standpoint, but because if allowed to flow into streams or other bodies of water, it results in contamination and creates a fire hazard. Figure 2 shows a design for a reinforced concrete separator box.

Sewers for Refineries

In refinery yards, sewers, in addition to their usual function, perform a duty of fire prevention. While not essentially part of the fire prevention system, the main trunk lines must be of adequate dimensions to carry off the concentrated water that will come from several hose streams in case of a fire in some part of the plant. Unless the sewers are of ample size, the water is likely to back up above the inlet surface, and burning oil floating on top of the water may thus be carried to other structures.

Figure 3 shows two types of concrete sewers that have come into very general use. The difference in the thickness of the concrete in the invert is caused by the bearing power of the foundations on which they will rest.

Coupled with structural characteristics, there are hydraulic features that must be borne in mind by the designer when considering sewers.

Small lateral sewers should be trapped to prevent a possible "flash back" to other sections of the plant in case they are laden with burning oil.

Figure 4 shows a simple design for a concrete sewer trap with a precast slab top for convenient access and cleaning out.

Loading Racks

For permanence without maintenance cost, loading racks constructed of reinforced concrete serve the purpose fully. They are neat in appearance, fireproof, easily constructed and act as rigid supports for the loading pipes. Figure 5 gives a simple design for a loading rack which is economical to construct, and which if properly made will last the life of the plant.

Large Concrete Reservoirs in California

Concrete tanks are structures that require special consideration in design and construction. Concrete in the walls of circular tanks, while capable of carrying high compression stresses, may crack when subjected to relatively low tensile stresses. To overcome this limitation reinforcing bars are imbedded in the concrete walls, sufficient in area to take care of the hoop tension developed.

If the tensile unit stresses ordinarily used in other forms of construction are applied to tank design these cracks may open to objectionable widths, with the repeated filling and emptying of the tank. The condition is further magnified by the tendency of the concrete to shrink during hardening which imposes an initial tension in the concrete and a corresponding compression in the embedded reinforcing.

Tension cracks in circular tanks can usually be traced to faulty design. Unit stresses of 14,000 or 16,000 pounds per squire inch are too high when used in tank design and will frequently result in the development of cracks in the structure.

When the tank is filled the first effect is to increase the tension in the concrete to the point of breaking, thus throwing into the steel the full hoop tension due to hydrostatic pressure. This change is likely to occur suddenly, which will assist in breaking the bond between the reinforcing and concrete, and is likely to cause cracks in a vertical plane. Repeated filling of the improperly designed tank gradually causes further slippage between the reinforcing and the concrete in the region near the cracks, thus permitting them to widen.

It is nearly impossible to treat these cracks with waterproofing for they open up only when the tank is full, and close to a certain extent when the tank is empty. Under the movement which results, the horizontal construction joints, especially the first one above the fixed base, are very likely to open up.

To overcome these difficulties in the conventional methods of design, low unit stresses must be used. The best engineering practice in this respect limits these stresses to 8,000 or 10,000 pounds per square inch.

W. S. Hewett of Minneapolis, Minn., has developed a successful design for reinforced concrete tanks in which the difficulties of the initial shrinkage stresses are overcome by building the circular walls with only a nominal amount of horizontal reinforcing; practically no more than is necessary to hold the vertical reinforcing in place. As soon as the forms have been removed from the shell, steel hoops are placed around the walls and put under initial tension before the tank is filled. Each band or hoop is made up of several rods, depending in size and number on the size of the tank, and these rods are connected by standard turnbuckles.

Recesses are formed in the outer surface of the wall to provide clearance for the turning of these turnbuckles. The rods are so assembled that in tightening the turnbuckles, the levers used can always be moved downwards. The rods are tightened to a predetermined initial tension by adjusting the length of the wrench or lever to the size of the rod and the weight of the man operating it. Since the man always tightens the rod with the wrench working down, and uses his whole weight on the wrench, very close results are obtained. Small variations are expected, but these are not serious enough to defeat the purpose of the design.

After all the hoops are tightened, the tank is filled with water for testing, following which the outer surface over and around the hoops is carefully covered with cement mortar or gunite thick enough to protect the bars from corrosion. This coating also gives additional bearing to the hoops. At times fabric is needed to hold this mortar covering in place, in which case it can be securely tied to the steel hoops.

Concrete is used extensively in the construction of mammoth reservoirs for the storage of oil in the California fields. The photograph shows concrete reservoirs with a capacity of 750,000 bbls. per unit, owned by the Shell Company of California and the Union Oil Co. A concrete reservoir constructed for the Pan American Petroleum Corp. at Lomita, Calif., has a capacity of 4,083,000 bbls. of oil.

Many of the largest oil companies operating in the Mid-Continent field have found VICTOR particularly suited for cementing wells. Its setting time is of great importance on these jobs as well as on refinery and tank construction work.

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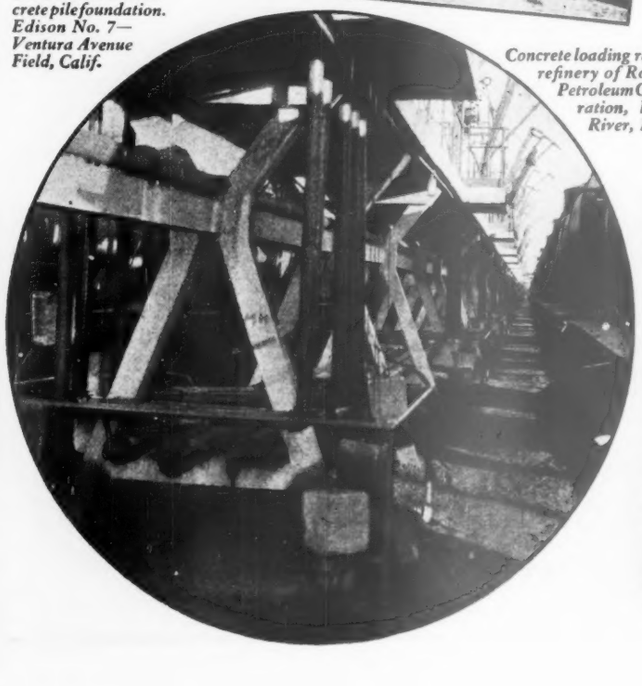
Preparing to cement water string in a cable tool hole at Borger, Texas.

CONCRETE is the most practical material for many construction requirements of the oil industry, because of its inherent qualities of economy and reliability under exacting conditions.

The field for its use is wide and varied, extending from the original source of petroleum, the oil well, through the processes of distilling, refining and converting into by-products, up to and including the point where the finished output reaches its market. Experience gained in the practical application of concrete to construction problems is constantly resulting in its adoption for new purposes.

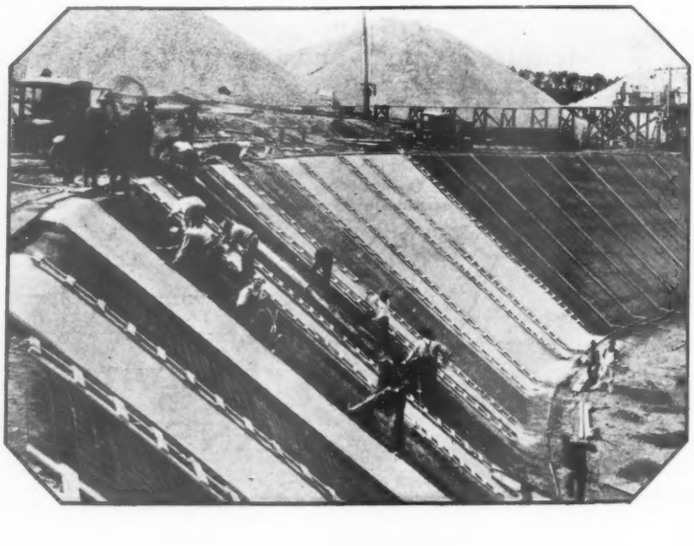
It is not enough that the petroleum engineer be thoroughly informed concerning the essentials of concrete construction. He must in addition specify the requirements for his structure in such a way that in the normal execution of the work, under a wide variety of conditions, he may expect these requirements to be effectively and economically carried out.

Oil derrick on concrete pile foundation. Edison No. 7—Ventura Avenue Field, Calif.



Concrete loading rack in refinery of Roxana Petroleum Corporation, Wood River, Ill.

Placing concrete lining for crude oil storage tank of the Standard Oil Company at Wilmington, Calif.



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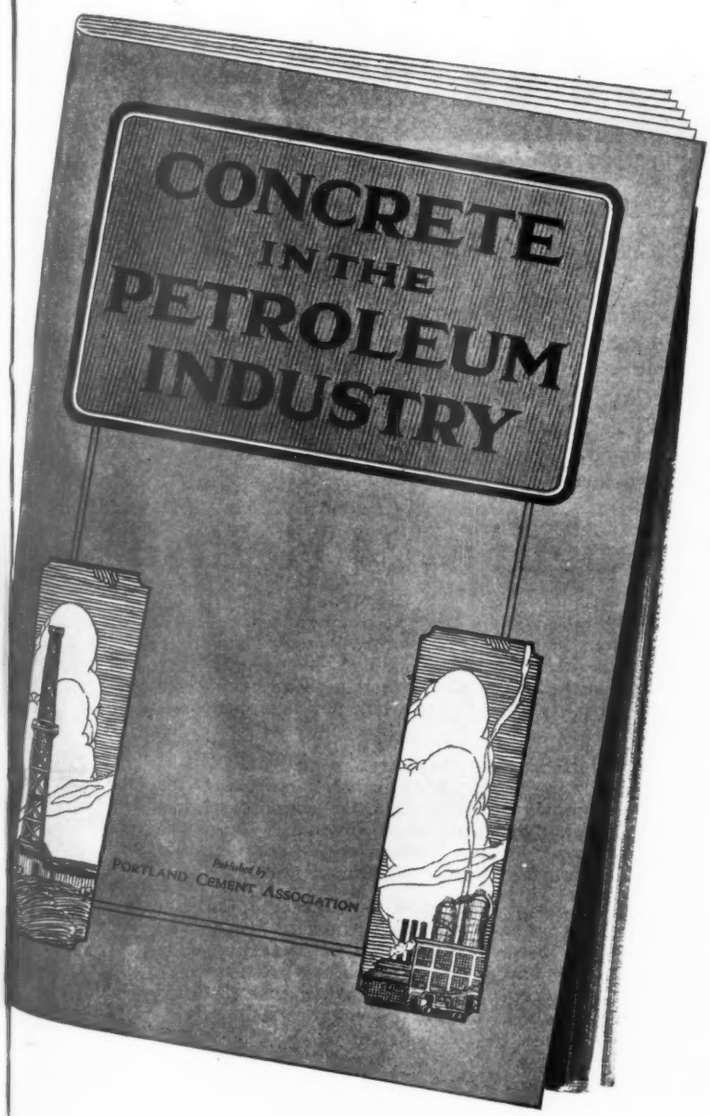

PRACTICAL information about the uses of concrete in the oil industry is briefly presented in the book illustrated on this page. It offers the basic laws which govern the making of good concrete for any purpose—and detailed suggestions for the highly specialized requirements of the driller and refiner.

Illustrated sections cover the subjects of cementing oil wells, construction of derrick corners and machinery foundations, reservoirs and tanks, and information on cold weather concreting.

The book is illustrated with tables and diagrams, and many pictures showing construction operations as well as finished installations. Other sections deal with modern refinery uses of concrete, covering almost every conceivable application.

Two sections are devoted to specifications, which are presented in the briefest possible form, and which are thoroughly practical for field use.

The book closes with a short list of publications and articles on uses of cement and concrete which have been found of special interest to oil men. A convenient index makes possible quick reference to any particular subject.

Sent Free to Any Oil Man

This book is being distributed, without charge, to all who have any kind of construction work interests in the oil industry. It is published by the Portland Cement Association to aid in making concrete of the greatest possible service to one of America's basic industries.

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A SERVICE ORGANIZATION

Originally organized in 1902 by a small group of cement manufacturers, the Portland Cement Association has grown to occupy a field of national service. Its purpose has been expressed in the statement "A National Organization to Improve and Extend the Uses of Concrete."

At the General Office in Chicago a well equipped research laboratory is constantly at work digging out facts which have a bearing on the practical application of concrete to an infinite variety of uses. A staff of engineers is on the job to work out the research laboratory findings in terms that make them useful to the concrete foreman in the field as well as the designer or technician in the office.

Thirty-two district offices (you will find a list at the bottom of this page) have been established to extend this service direct to all parts of the country. Field engineers, traveling from these district offices, make direct contacts with construction operations of every kind.

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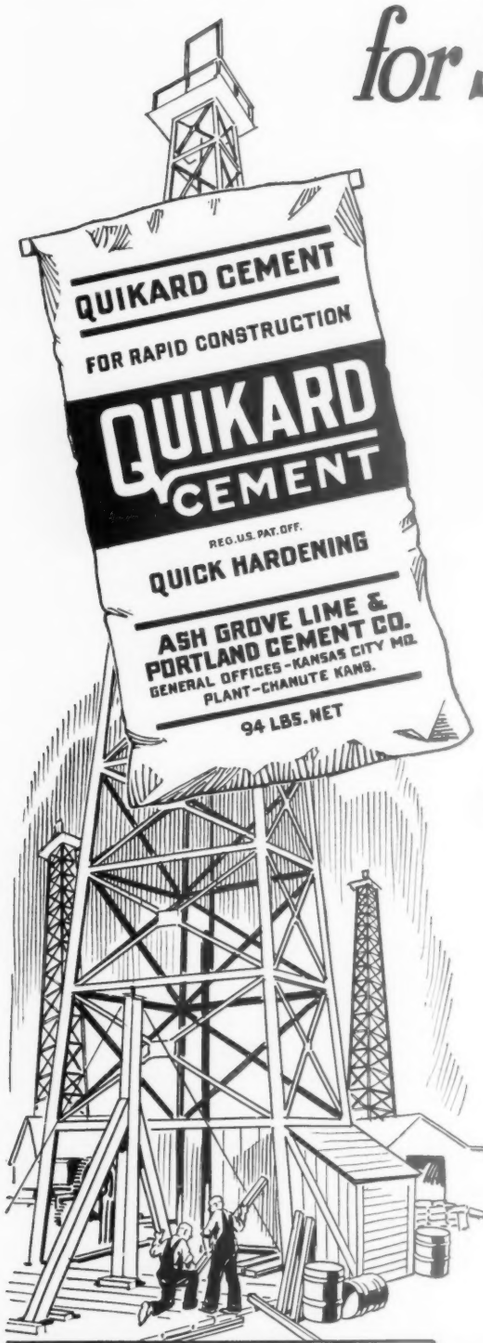
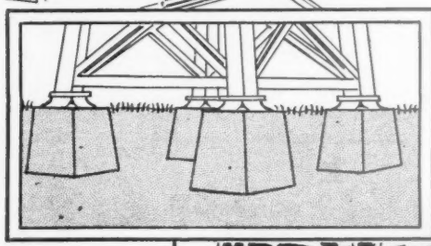
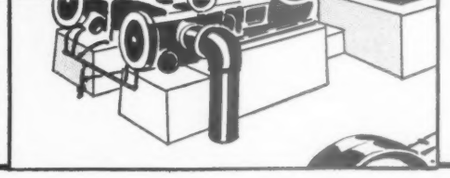


Derrick piers of QUIKARD Cement withstand heavy strain and stress within 24 hours after placing.





Bases of QUIKARD Concrete for oil compressers and other heavy machinery are ready for duty many days sooner.

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This means that properly-made Quikard concrete can be used with safety from 20 to 36 hours after placing—saving from three to four weeks on your concrete construction and repair work. And it not only attains standard 28 day strength requirements for Portland Cement concrete in 24 hours, but develops increased strength thereafter!

You can set your derrick in concrete piers made with Quikard and start operations within 48 hours *at the most.* Floors, bases for machinery, powers, pumping equipment, booster stations, etc., can all be put in service within the same length of time if Quikard is used. In fact, you can *safely* use Quikard *anywhere* for rapid construction without sacrificing strength or permanence!

Quikard is *not* quick-setting. It takes its initial and final set normally allowing plenty of time for proper mixing, placing and finishing. It is worked just like Portland Cement, is unusually plastic and finishes quickly and easily. It produces an exceptionally waterproof concrete and is constantly uniform at all times. It forms a perfect bond with new or old Portland Cement concrete.

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If your dealer does not stock Quikard Cement, write, wire or phone us. Packed in durable paper bags, it may be shipped in mixed cars with Ash Grove Portland Cement or Oilmax Cement. Quikard Cement is *not* an experiment—it is a *proven* product, having more than made good on important projects throughout this territory. It is the exclusive development of one of the oldest, most substantial and successful manufacturers in the cement industry!

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CONCRETE IN THE PETROLEUM INDUSTRY

(Continued from Page 76)

results in this condition should be avoided.

Curing

The hardening of concrete is a chemical process known as hydration, which requires water. The water used in mixing the concrete must therefore be kept from evaporating, or water must be added to the surfaces of the newly placed concrete to replace that which may be lost by evaporation. This process is called curing. It is especially important to adopt proper curing methods during warm or windy weather and to give unusual attention to concrete that has a relatively large surface exposed. Proper curing is a necessity in the production of watertight concrete.

The concrete should be protected by some covering material such as burlap, canvas or sand which should be put in place as soon as it can be done without marring the surface. This covering should be kept continually wet for at least a week and longer if possible. Leaving the forms in place is also of assistance in preventing evaporation; when practicable the forms should be wet down to keep them moist.

Early Use of Concrete

When early use of a new structure is desired, consideration should be given to certain factors that will give high early strength to concrete. Briefly these are: Further limitation of the mixing water; richer mixtures; more thorough mixing (accomplished by lengthening the mixing time); and protection of the concrete asphalt against temperatures below 50 degrees Fahrenheit during its making, placing and curing.

As an example of what may be accomplish by reducing the mixing water, with all other conditions favorable to making and curing, the accompanying table indicates the compressive strengths in pounds per square inch that different water contents will give at the ages shown.

Water gallons per sack cement*	Age at test: 7 days	28 days
7⅛	1,100	2,000
6¼	1,500	2,600
6	1,800	3,000

*Including the moisture in the aggregates.

Within certain limitations calcium chloride or calcium oxychloride may be used in portland cement mixtures to hasten hardening and to increase early strengths. The amount of the admixture required to produce the most beneficial effect seems to be dependent upon the chlorine content. Only small amounts of these admixtures may be used to advantage. The greatest acceleration is obtained with 2 to 4 per cent of calcium chloride or 7 to 10 per cent of calcium oxychloride by weight of the cement. With these percentages, tests covering a period of years show no indications of reduced strength. If quantities of these materials greater than the above amounts are employed, the strength decreases rather rapidly.

There is evidence to show that calcium chloride and similar compounds do not react in the same manner with all brands of portland cement. Trial batches of the brand of cement and the brand of accelerator proposed to be used should be made up and the rate of hardening at the specified temperature noted before proceeding with their use in important work.

Cold Weather Precautions

Temperature affects the rate at which concrete hardens, the lower temperatures reducing the rate until it practically stops at the freezing point. Alternate freezing and thawing will completely destroy concrete, while a single freezing may impair the strength and durability of the structure. Because of these facts, special precautions are required for cold weather work and should be employed when it is expected that the temperature will fall as low as 50 degrees Fahrenheit.

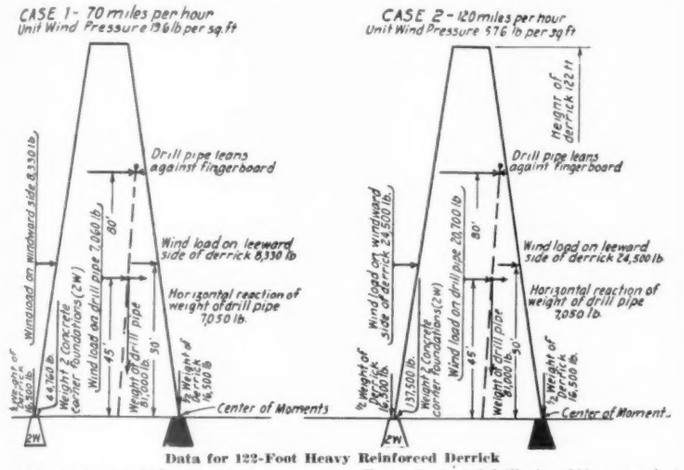
Heating aggregates and mixing water and enclosing the work, together with provision for artificial heat over a period of five or six days is the usual method of protecting concrete. If it can be kept at around 60 degrees for this period it will have attained sufficient strength to make it safe against freezing.

Common or rock salt or other admixtures should not be added to concrete to prevent freezing. When chemicals are used in quantities sufficient to lower the freezing point of water to any extent, they reduce the strength materially.

Method of Adding Accelerators

When it is desired to introduce calcium chloride or oxychloride into concrete, the chemical should be prepared in a stock solution that will contain the

(Continued on Page 89)


CASE 1- 70 miles per hour
Unit Wind Pressure 19.6 lb per sq ft
Wind load on windward side 8,330 lb
Drill pipe leans against fingerboard
80'
Wind load on leeward side of derrick 8,330 lb
Wind load on drill pipe 7,840 lb
Horizontal reaction of weight of drill pipe 7,050 lb
45'
30'
Weight of drill pipe 7,050 lb
½ Weight of Derrick 16,500 lb
Weight of derrick 16,500 lb
Weight 2 Concrete corner foundations (2W)
Center of Moments
2W
CASE 2 - 120 miles per hour
Unit Wind Pressure 57.6 lb per sq ft
Height of derrick 122 ft
Drill pipe leans against fingerboard
Wind load on windward side of derrick 24,500 lb
Wind load on drill pipe 23,100 lb
Wind load on leeward side of derrick 24,500 lb
Horizontal reaction of weight of drill pipe 7,050 lb
½ Weight of Derrick 16,500 lb
Center of Moments

Data for 122-Foot Heavy Reinforced Derrick

Weight of derrick 33,500 pounds.
Exposed area per side, 425 square feet.
Weight of drill pipe, 81,000 pounds.
Exposed area of drill pipe, 360 square feet.

Unit Wind Pressures

70 miles per hour.....19.6 lbs. per sq. ft.
120 miles per hour.....57.6 lbs. per sq. ft.
Base dimension.....24 ft. x 24 ft.
Finger board height...80 ft.
Weight of concrete....150 lbs. per cu. ft.

Wind Pressure Formula

$P = 0.004\ V^2$

P—pressure, pounds per square foot.
V—velocity, miles per hour.

V	P	V	P	V	P
30	3.6	80	25.6	110	48.4
50	10.0	90	32.4	120	57.6
70	19.6	100	40.0	130	67.6

Clockwise Movements:

Drill pipe reaction .. 14,110×45= 635,000
Derrick reaction ....2× 8,339×50= 833,000
Total 1,468,000

Counter-clockwise Movements:

½ derrick weight ..... 16,500×24= 396,000
2 concrete corners .....2×W×24=1,072,000
W =Necessary weight of each corner foundation
=1,072,000÷48=22,380 pounds which requires 5.6 cubic yards of concrete.
Horizontal reaction of drill pipe weight, 7,050 pounds.

Clockwise Movements:

Drill pipe reaction ... 27,750×45=1,248,750
Derrick reaction ....2×24,500×50=2,450,000
Total 3,698,750

Counter-clockwise Movements

½ derrick weight .....16,500×24= 396,000
2 concrete corners .....2×W×24=3,302,750
W =Necessary weight of each corner foundation
=3,302,750÷48=68,750 pounds which requires 17.0 cubic yards of concrete.

(Used through courtesy of H. H. Anderson and American Petroleum Institute.)

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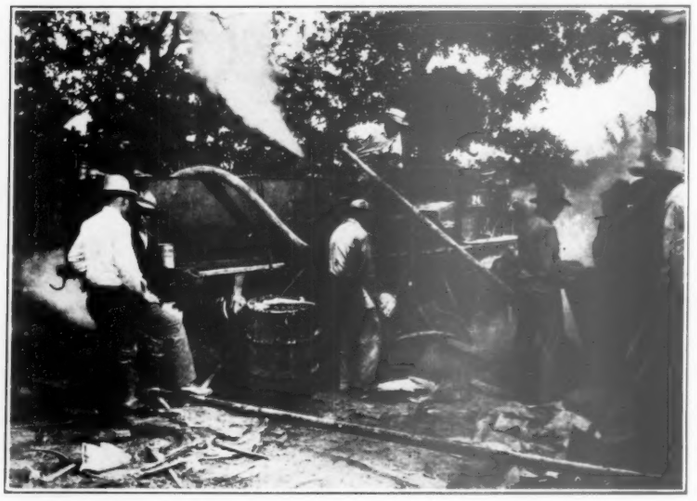
Use of Cement in Oil Wells Grows

Conservative Estimates Indicate That 25 Times as Much Was Consumed Thus in 1927 as in 1919. "Two-Plug" Method General

By Thomas F. Smiley

If all the 96-pound sacks of cement used in cementing oil wells in the United States last year were piled on a great blanket and all the 2,342,474 population of Oklahoma gathered around and grasped the edges of the blanket in an effort to raise the mass from the ground, and if each man, woman and child had a lifting power of 100 pounds, they would tug and grunt in vain. For it is conservatively estimated that 2,500,000 sacks of cement were put down oil well holes in 1927, and that would make a total weight of 240,000,000 pounds.

To form an idea of the rapid growth of cement use for shutting off water in oil wells it need only be noted that in 1919 less than 100,000 sacks were used thus. In other words, 25 times as much cement was consumed in this way in 1927 as in 1919. In the Mid-Continent Field, 1,500,000 of these 96-pound sacks were used in 1927 by the Halliburton Oil Well Cementing Co., which performs virtually all this work in that field. This compares with 19,000 sacks used in 1919 by that company. California used 500,000 sacks in 1927.



Cementing equipment in operation. (Gypsy Oil Co. lease, Seminole, Okla.)

Each cementing operation in an oil well requires from 35 to 3,000 sacks of cement. The average requirement is estimated to be 200 sacks for each well.

Erle P. Halliburton, head of the cementing company which bears his name, is a pioneer in the solution of water problems in the oil field through the use of cement. The method employed by him is the "two-plug" method patented by A. A. Perkins, of Los Angeles, Calif., with the addition of important features by Mr. Halliburton himself. Mr. Halliburton obtained the rights to the Perkins process in the Mid-Continent Field. The method consists basically in establishing a water circulation down the casing and up the space outside and introducing mixed cement into the casing above the water and separated from it by a plug, then forcing the cement down, driving the water before it.

Water or mud fluid is pumped into the casing on top of the cement, from which it is separated by a second plug, forcing the lower plug, the cement and the upper plug down the hole. The cement is pushed out of the casing, covering the hole at the bottom and working up and around the casing and the interior of the hole.

In this process of cementing an oil well, a special truck bearing two pumps is used. One of these pumps is capable of developing 200 to 500 pounds pressure and this is employed in forcing a stream of water from a water tank into the mixer. The other pump is used to force the mixed cement from a sump into the casing through a 2-inch hose and a tight casinghead. The pumps are operated by steam from the boilers at the well.

The mixer consists of a funnel of steel about 3 feet high, with a 6-inch opening at the bottom, fitted into a 6-inch ell. The ell is connected to a swage nipple, reducing the diameter to 3 inches. A 3-foot length of 3-inch pipe completes the mixing chamber. Additional pipe or a hose leads to the sump, where the cement in a thick liquid condition is deposited.

The mixer is so devised that it enables the operator to use a large amount of cement in a short time. Speed is an important factor in this work, for the cement must be mixed and forced into position before it begins to set. The whole operation should be performed in two hours if satisfactory results are to be gained. Under ordinary conditions one of these outfits will mix and pour 750 sacks of cement in 45 minutes.

There is welded into the back of the ell, at the bottom of the cone, or cement hopper, a three-eighths inch pipe, fed by a 2-inch pipe. As water is forced through the smaller of these pipes, the opening of which has been constricted, a rotary motion is observable in the jetted water. The high velocity of the jetted water creates a vacuum on the hopper and the cement is drawn forcibly into the ell, making it possible for a large amount of the cement to be handled in a short time.

The cement and water comes into intimate contact in the nipple and the 3-inch pipe, which as a matter of fact is the real mixer. The constant flow of water at high pressure forces the mixture into a half-barrel sump dug in the ground near the well. The suction from the second steam pump lifts the mixed cement and drives it into the well. This pump is capable of developing a pressure of 1,400 pounds.

Measuring Device Important

After the right amount of cement has been placed in the casing the second plug is introduced on top of it. A measuring device, invented by Mr. Halliburton, shows the precise position of the top of the upper plug as the column of cement moves down the casing. As the water or mud fluid is pumped on top of the cement to force it into position the measuring device enables the operator to stop the column of cement at any point in the casing or to force it to any desired height in the hole around the casing. It is a common practice to use the regular mud pump of a rotary rig to force the water or drilling fluid into the hole, which crowds the cement into the desired position. When the top plug is in place the measuring line is withdrawn and the cement is permitted to set before drilling into the sand is completed.

Many benefits accrue to the operator who has a good cementing job at the top of a productive oil sand. A properly cemented water string prevents water from encroaching from above and it reinforces the casing at the bottom, where the greatest external pressure is exerted. Cementing also protects the casing from corrosion resulting from circulation of contaminating liquids in the hole. It reinforces the support of the casing and lessens the danger of shooting off the shoe or seat when a torpedo is exploded near the pipe. Where several sands have been pierced, the cement prevents the different fluids from migrating.

The formations encountered in some oil fields do not give the casing the support needed at the right level. In such cases cement is used almost without exception and it was largely through the existence of such formations that the demand for cementing has grown to such proportions.

Many operators assert that money could be saved by cementing the water string and pulling the other strings of pipe in the older cable-tool districts and where cable points have adequate formations for seating the pipe. In some districts several strings are left in the hole after it has been completed, and it is declared that cementing would make this unnecessary.

Mr. Halliburton says he is able to cement casing several hundred feet off the bottom and he has cemented exceptionally long strings. He recently cemented a string of 8¼-inch casing 6,400 feet long, said to be the longest string of such size casing ever cemented.

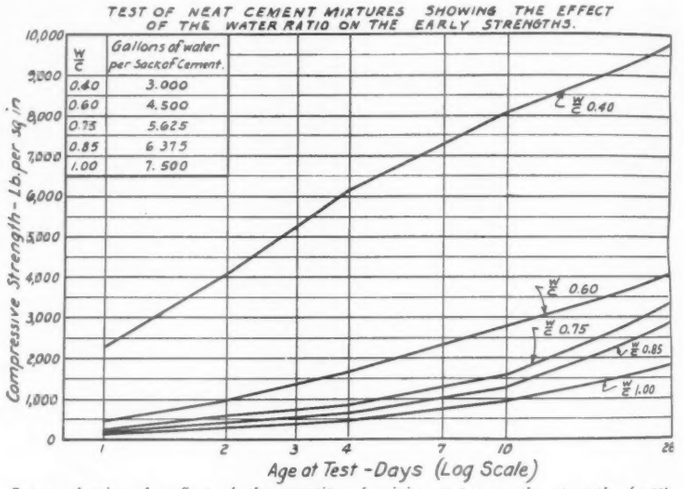
There are just two materials to be considered in this operation of cementing an oil well, but each of them plays an important part in the results obtained, hence their functions should be well understood. These materials are cement and water. Sometimes a chemical reagent is used as a third material. The same requirements that apply to the quality and use of these materials in making concrete apply to their use in making neat cement grout for cementing wells. In particular reference to chemical reagents that come ready prepared in a liquid state, the recommended proportions found on the labels of the containers should in no case be exceeded. Definite knowledge of the immediate and ultimate reaction to be expected from the use of any admixture should always be obtained before it is used with portland cement.

Getting the Right Consistency

Probably the most important consideration in oil well cementing is the consistency of the grout as it is placed in the wells. The ratio of the amount of mixing water to the amount of cement controls the ultimate strength, impermeability, and bond resistance of the hardened grout in the well.

Extensive tests conducted in the Portland Cement Association Research Laboratory, have conclusively shown the effect of mixing water on neat cement grouts mixed in consistencies commonly used in cementing oil wells.

Figure A gives the results obtained in these tests, and the effect of excessive mixing water is clearly reflected in the low strengths at all ages of the specimens containing a high percentage of water. It was thoroughly appreciated that grout of a water-cement ratio of 0.40 is too thick to be handled by any pumps yet designed for placing cement in oil wells, but the data are presented to demonstrate more thoroughly the effect of the mixing water on the ultimate strength of the grout.



Curves showing the effect of the quantity of mixing water on the strength of neat cement grouts.

It is highly advisable to use the thickest grout, or the grout with the lowest water content that can possibly be handled with the cementing pumps, or that can be used when particular conditions in the well are considered. The cement grout being used should be maintained at a uniform consistency throughout the entire operation.

Chemical reagents if used, should in all cases be mixed with the mixing water in the storage tank that is part of the cementing outfit. Only in this way can the correct percentages of the reagent be guaranteed. Chemicals should under no circumstances be poured into the grout after it has gone through the mixer. There is no possibility of proper control in this method and the end sought in the cementing operation may be completely lost on this account. Liquid introduced in the grout after it has gone

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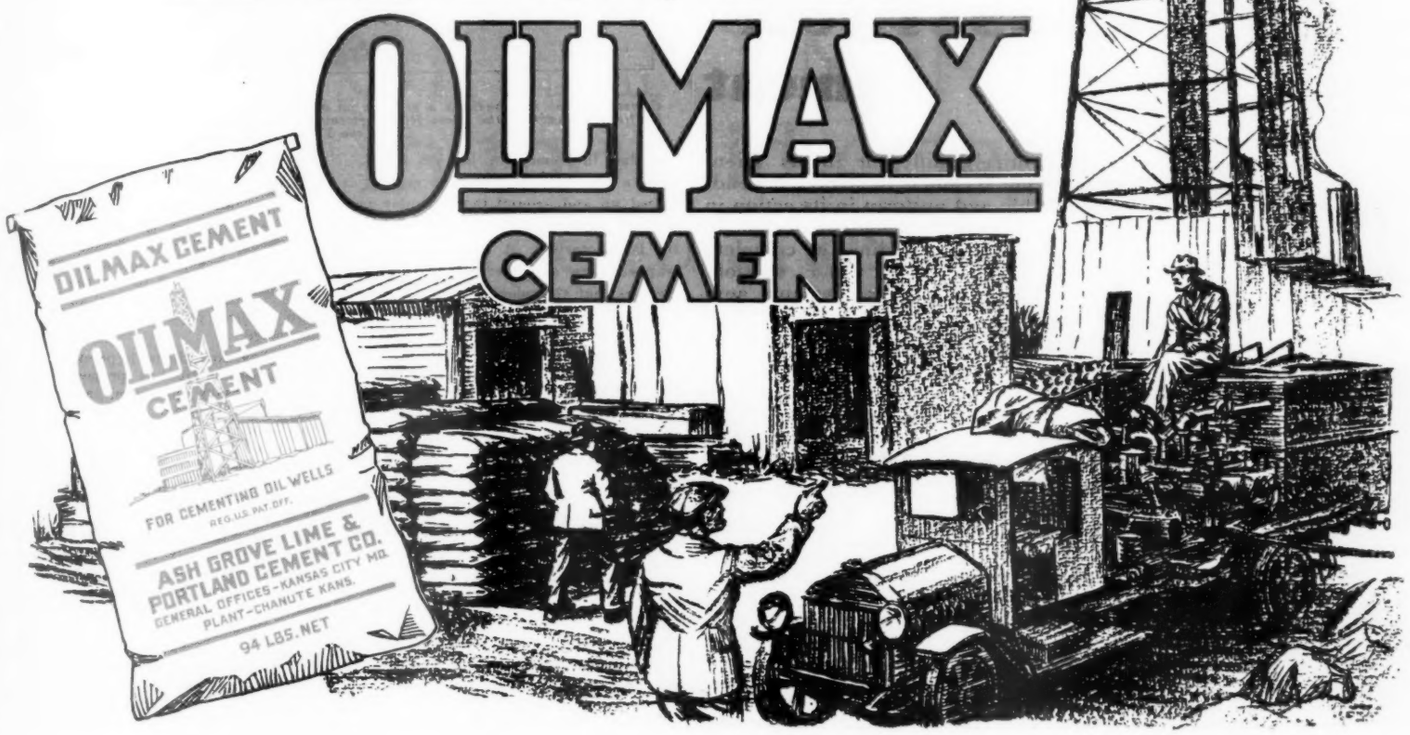
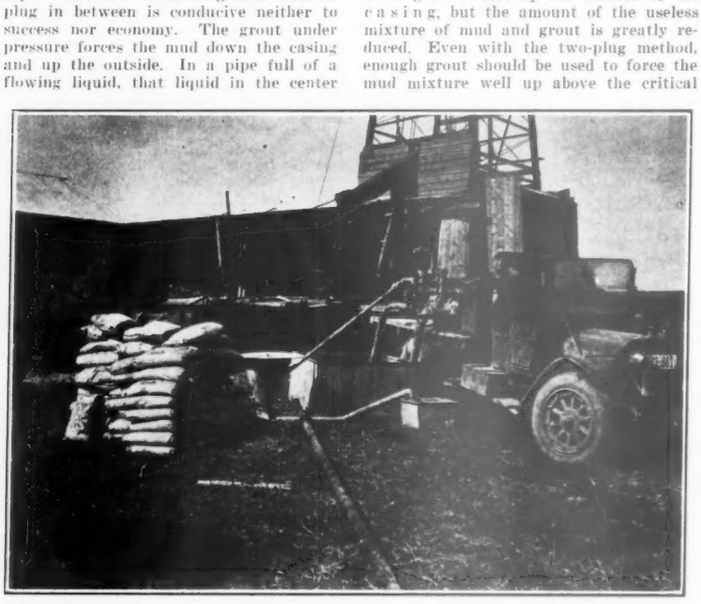


through the mixer increases the water-cement ratio and proportionately reduces its ultimate strength.

In cementing a casing in a deep hole it is highly advisable to use two plugs. To pump cement grout into the casing on top of a column of drilling mud with no plug in between is conducive neither to success nor economy. The grout under pressure forces the mud down the casing and up the outside. In a pipe full of a flowing liquid, that liquid in the center of the pipe moves at a greater rate of speed than that on the sides. When there is no plug between the grout and the mud, there is an ever-increasing point of grout extending into the column of mud that eventually mixes with the mud, resulting in the formation of a varying amount of weak and worthless material. Just how much cement is wasted by this mixing with mud in its downward movement is impossible to estimate.

If two plugs are used, there inevitably is some mixing with mud when the cement grout starts up the outside of the casing, but the amount of the useless mixture of mud and grout is greatly reduced. Even with the two-plug method, enough grout should be used to force the mud mixture well up above the critical stratum, leaving only the unadulterated grout at the shoe where it is most desired.



Cementing equipment in position to start operation. (Phillips Petroleum Co. lease, Borger, Texas.)

Reaming Important

In a cable tool job, the hole should be well reamed at the bottom before the casing is run. The shape of the grout mass when set, and its distribution radically as well as vertically, have much to do with its effectiveness. It is well known that a string of casing will not hang concentrically within the hole, that neither casing nor hole will be absolutely straight, and that at many points the casing will be in contact with the wall of the hole. It is not practical to drill a hole enough larger than the casing to prevent these conditions, but reaming will help matters greatly.

In an unreamed hole, when the grout is forced up the outside of the casing, there will be no grout at the points of contact between the casing and the side of the hole, and there will be a deposit on the opposite side of the casing ranging from 3 to 4 inches up to several feet thick in caving formations.

A local projection of the wall in contact with the casing here or there will probably not jeopardize the result of the cementing job. If, however, the contact points are so numerous that they constitute a line of contact connecting a water sand above with the bottom of the casing, thus permitting the water to flow into the oil or gas-bearing stratum along this line, the cementing job has failed.

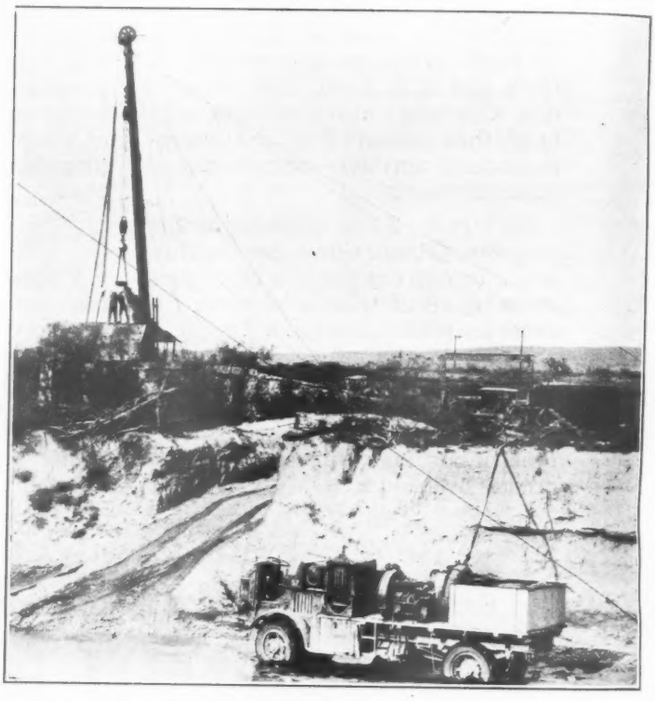
In a well-reamed hole, the cement is forced up and around the irregular projections of the sides of the hole, filling the large crevices. A little mud may be trapped here and there in the smaller crevices, but this should cause no harm. It seems unlikely that the grout will wash all the mud out of these small spaces, and on this feature hinges a much-argued question as to the advisability of the use of a thin mixture of cement grout. Advocates of the thin mixture contend that it will wash the mud out of the narrow places better than the thick mixture, and allow more grout to be placed. Cement experts say this is not a good argument, for it has been demonstrated that just as good, if not better, results can be gained by thinning the mud fluid and circulating it for a few minutes before the grout is run. Under no condition should the cement grout be made any thinner than is absolutely necessary to its proper handling.

Cementing Through Tubing

It frequently happens that when drilling is resumed after a casing has been cemented, the hole will run into a water sand that may or may not start caving, and the well may be making three or four bailers of water an hour. In cementing to shut off this water, the job should be done by the tubing method and the hole thoroughly washed out with clean water before cementing is started.

Cement grout should never be allowed to fall the full length of the casing. If the well has been bailed until the time of cementing, the inside of the pipe is coated with mud and saline water, all of which will be carried to the bottom of the well if the grout is pumped into the top of the casing and let fall to the bottom. In this method there is an hour or more lost, while the plug is inserted and forced down the casing. During this interval the well will probably be making water that will be filtering through the grout, which will weaken and may eventually ruin it if not checked in time.

This can be avoided if the tubing method of cementing is used. The well can be properly washed out ahead of the placement of the grout and the grout quickly pumped in the hole under pressure. Loose pieces of shale or any foul water in the hole will be kept on top of the rising mass of grout and will eventually be forced up into the bottom of the casing where they can do no harm.



Cementing pipe is sometimes a problem on account of the scarcity of water. Here is a Halliburton outfit on the Pecos River cementing No. 2 Thompson of the Gulf Production Co. in the Yates Field.

Maintaining Pressure

In any type of job where pressure is required to offset gas pressures or other static forces in the well, great care should be exercised to see that the pressure is tightly sealed in the well for two or three days or until the grout has hardened.

It has sometimes happened that the cementing outfit has properly built up the necessary pressure, and left the valve in the swage nipple tightly closed to maintain the pressure in the well. Later the drilling contractor desires to remove his elevator and finds that he cannot get it over the swage valve. The valve is removed for a few minutes while the elevator is pulled up. Under this condition the built-up pressure is, of course, completely lost, and if the grout has not had time to harden properly, it may be ruined by the percolation of water or gas which the built-up pressure had held back.

This trouble can easily be avoided by proper instructions to the crew, or arranged for at the start of the job by the use of a smaller gate valve, or an elevator of adequate clearance.

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CONCRETE IN THE PETROLEUM INDUSTRY

(Continued from Page 85)

recommended proportions and be added to the concrete as part of the mixing water.

As an example, assume that it is desired to add a 2 per cent proportion of calcium chloride to the mix. Prepare a standard solution in a 50-gallon barrel placed near the mixer. The barrel should be filled about two-thirds full of water, in which 100 pounds of commercial flake calcium chloride is thoroughly dissolved. Filling the barrel with water will then produce 50 gallons of the stock solution, having approximately 2 pounds of calcium chloride in a gallon. The concrete is mixed in the usual manner except that 1 gallon of the solution for each sack of cement is substituted for an equal amount of mixing water.

Concrete in the Oil Fields

Derrick-Corner Foundations—The first construction operation in the production of oil is the erection of the derrick and rig at the well site. The first operation involved in erecting a derrick is the construction of suitable corner foundations. The essentials of a good foundation are rigidity, permanence of elevation and alignment, and permanence of the base itself.

The maximum load imposed on the derrick corners will be the total of the dead load of the derrick, the live loads of the pipe and tools going into the hole, and the vertical reaction of the wind load. From this loading and the character of the foundation bed is determined the necessary area of bearing at the base of the corner. The quantity of concrete placed under the corners of a derrick should be that required to distribute properly the ultimate maximum load over the predetermined area of foundation bed, and to provide the necessary weight to prevent overturning. In certain localities where high winds prevail, and where at times the wind reaches hurricane velocities, this latter requirement is of major importance.

Derricks designed under new A.P.I. specifications will be sufficiently strong to prevent collapse of the structure under wind velocities specified on the new plates. A derrick can be kept in stable equilibrium under all conditions by attachment to sufficiently heavy corner foundations. Figure 1 illustrates the use of concrete foundations to prevent overturning, and the method of determining the weight of concrete required. A cubic foot of concrete made with stone or gravel coarse aggregate will weigh approximately 150 pounds. If blast furnace slag is used as a coarse aggregate, the weight would be reduced to possibly 140 pounds per cubic foot.

These computations are in accordance with the methods used in A.P.I. specifications, giving due consideration to the possibility of extra surfaces exposed to the wind such as a setback of pipe leaning against the finger board.

Derrick foundations must be able to carry the weight of strings of pipe during hoisting and lowering. At times the weight of this pipe is carried by the setback racks and the rotary table or spider. This requires sills to be placed under these centers of loads. Concrete sills afford maximum rigidity and strength, both of which factors are necessary to the proper functioning of the rig.

Pile Foundations

In swampy and lake areas it is sometimes necessary to use piles under the derrick. At times of freshets in certain river locations in California a peculiar condition arises in which whole foundation beds, to a depth of 8 to 10 feet, move horizontally. This movement may completely ruin the alignment of a derrick unless it is carried by piles to a firm stratum below. Figure 2 shows a foundation on concrete piles designed to overcome this difficulty. This is No. 10 Edison, in the Ventura Avenue Field, with a 5¾-inch oil string set at 6,620 feet.

In this instance, a 122-foot derrick and combination rig were set about 12 feet above the river bed on nine 26-inch square concrete piles, each imbedded 26 feet into the foundation bed. One pile was placed under each of the four corners, one under the Sampson post, and four under the standard rig. The concrete piles gave the derrick the necessary rigidity during the constant impact of drilling, hoisting and lowering of pipe, casing and tools, that would have been almost impossible to get with any other type of material. In addition, the piles permanently preserved the alignment of the derrick from the action of the movement of the stream bed during freshets. This is one of the deepest wells now producing commercially, and at one time the derrick floor supported both the entire string of 5¾-inch casing weighing 132,500 pounds and a string of 4-inch drill pipe weighing 109,300 pounds.

The Mix

Not more than 7 gallons of water per sack of cement, including the moisture in the aggregates, should be used for making concrete for derrick corners. The aggregate should be proportioned so that the coarse will not exceed twice the quantity of fine. The A.P.I. specifications for concrete derrick corners provide that the mixture shall be not leaner than 1:2:3½.

Frequently in the oil fields the sand in the stock pile will be very wet, especially after a heavy rain, and in using the amount of sand specified, a great deal of water will be included therein. As a general rule, when concrete for derrick corners is being made, if the sand is very wet, the mixing water should be cut down to 6 gallons of water for each sack of cement; if the sand is fairly damp, 6½ gallons of water per sack is recommended. When the sand is dry, 7 gallons of water per sack is satisfactory, but never under any circumstances should there be used any more than 7 gallons of water for each sack of cement in the mix. There is usually a 5-gallon can of some description around a derrick site that can be used for measuring water. An ordinary water bucket holds 3½ gallons, but this should be verified before being used.

The foreman should be instructed how to gain workability by changing the amounts of aggregate. After a trial or two he will find that he should not allow the amount of coarse aggregate to be so large that the resulting concrete will be harsh in handling and placing. The consistency of the resulting mass should be that the mixture can be placed in the forms without segregation or the accumulation of water on the surface. Concrete should be conveyed to the forms by some means which will insure that it does not segregate. During placement it should be thoroughly spaded in layers not more than 12 inches thick in order to remove impounded air and water.

Machinery Foundations

Foundations for heavy equipment such as air compressors, gas eliminators and casinghead gas plants, can most economically be made of concrete which should be well designed both as to quantity and quality. Manufacturers of machinery usually recommend the dimensions and weights of foundations necessary to the maintenance of stability and equilibrium of their implements under operation. Concrete for this purpose should be carefully made by rigid adherence to the use of not more than 7 gallons of water per sack of cement, which must include the full moisture content of the aggregates.

UNIT CONSTRUCTION

Walls or piers of concrete masonry laid up in portland cement mortar are used in unit construction. The mortar adheres tenaciously to materials of a similar nature producing the best possible bond. Where exceptional strength or watertightness of joint is desired a mortar consisting of one part of portland cement, 3 parts of well graded sand and 10 per cent of hydrated lime (or its equivalent in lime putty) by weight of cement is recommended. For general purposes, a mix of one part cement, one lime and six of sand by volume is sufficient.

During 1927 more OK SUPER-OIL-WELL CEMENT was used in the Mid-continent than all other brands combined. This fact is significant.

OKLAHOMA PORTLAND CEMENT COMPANY

1018 PERRINE BUILDING OKLAHOMA CITY.

TNEMEC PAINT

Prevents Disintegration of CONCRETE *by Protecting the Surface from Moisture*

Moisture penetrates the surface of even the finest concrete. Then freezing causes hair cracks; moisture reaches the steel reinforcing; the rusting metal expands and forces off sections of the concrete. TNEMEC Paint keeps moisture OUT and thus prevents this disintegration.

TNEMEC Paint, being made of Pure Portland Cement pigment permanently suspended in Pure Linseed Oil by a patented process, adheres perfectly to concrete surfaces and sets into an exceedingly tough veneer that is impervious to moisture.

"If CONTINENTAL Sells It, There Is No Better"

THE CONTINENTAL SUPPLY COMPANY

General Offices: St. Louis

Export Office: 74 Trinity Court, New York
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THE CONTINENTAL SUPPLY COMPANY, Ltd.
69 Thomas Block, Calgary, Alberta, Canada

CONTINENTAL

MIXING CONCRETE BY HAND FOR DERRICK FOUNDATIONS

Concrete for derrick corner foundations is usually hand mixed on the previously constructed derrick floor. The boards of the floor should be laid tightly together to make a watertight mixture platform.

The procedure in mixing concrete by hand is as follows:

The carefully measured quantity of sand is spread out evenly on the platform. On this the required amount of cement is dumped and evenly distributed. The cement and sand are then turned over thoroughly with square end shovels enough times to produce a mass of uniform color, free from streaks of brown and gray. Such streaks, when present, indicate that the sand and cement have not been thoroughly mixed.

This mixture is spread out evenly over the platform and the required quantity of gravel or broken stone is measured and spread in a layer on top. The materials are again turned and mixed with shovels until the stone has been uniformly distributed throughout the mixture of cement and sand. Three or more complete turnings will be necessary.

A depression or hollow is then formed in the center of the pile and the proper amount of water added slowly while the materials are turned in toward the center with square end shovels, this turning being continued until the cement, sand and stone have been thoroughly and uniformly combined and the desired workability and smoothness obtained throughout the mixture.

PATENT OFFICE TELLS STORY OF OIL WELL CEMENTING PROCESSES

Astonishing tales could be related of the experiences and patience-exhausting trials which accompanied the struggles of men in early chapters of deep-well drilling to cope with that ever-present enemy, "water." It is interesting to trace the origin and development of the basically different processes of well cementing and to point out the United States patents which appear as mile posts in the advance of well-cementing methods and apparatus.

As early as 1885 the possibilities of utilizing hydraulic cement to sheathe wells were realized, as evidenced by a patent issued to Samuel McEachen of Pennsylvania in that year. This patent discloses a complete method of cementing water wells both to protect the casing from the destructive action of sulphur water and to prevent water from the surface or intermediate strata from gaining access to the productive zone. McEachen's idea was to make the casing considerably less in diameter than the hole and to inject the cement into the space surrounding the casing from the top. This method, of course, would not solve the water and cave-in problems encountered in deep-well drilling, and is cited merely to illustrate that the cementing problem is not a new one.

Advance in developing well cementing was apparently sluggish for some 15 years after this. Prior to 1900 operators were using cement to build up cave-ins in uncased wells by filling a cave-in with cement through the use of a dump bailer and continuing the drilling after the cement had set.

Perkins and Double originated the Perkins method and obtained a patent on it in 1911.

The Perkins Method

In the Perkins method two wood packers or plugs play an important part. They are of a diameter permitting them to move in the well casing. The casing in a well to be cemented was elevated above the bottom for a distance slightly greater than the length of the lower plug. This plug then was inserted in the casing and a predetermined quantity of cement was pumped in followed by the upper plug. Mud fluid or water then was pumped into the casing under pressure to force the plugs and the charge of cement down the casing. When the lower plug reached bottom there was sufficient space between it and the end of the casing to permit the discharge of the cement into the space surrounding the casing.

As pressure was maintained on the upper plug it continued to move downwardly in the casing, ejecting the cement which must necessarily travel upward between the casing and the sides of the hole. This continued until the upper plug engaged the lower plug after ejecting practically all of the cement from the casing. When the upper plug stopped, the lower end of the casing was plugged and the pressure above increased to such an extent that it would stop the pump, indicating that all of the cement had been ejected.

With the introduction of casing-shoe guides—and various floating devices—it was found necessary to change the design of the lower plug, which could not be forced beyond the bottom of the casing-shoe on account of the aforementioned obstructions. The lower plug is now shaped to conform more or less to the shape of a shoe guide or plug and not depress any protruding valve stems which may be used in conjunction with a shoe guide or floating plug. Holes are provided for in the lower plug to allow the cement to pass through it.

In all essentials the Halliburton process, employed in the Mid-Continent Field, is the same as the Perkins method except that it is modified by the addition of equipment such as measuring lines to determine the location of the plugs in the hole.

About the time of the conception of the Perkins method inventors became active and several different processes were originated for cementing wells. Most of these met with indifferent success. One method practiced during this period required that cement be placed in the bottom of a hole by means of a dump bailer or otherwise. Thereafter mud fluid was deposited on top of the cement and the casing was elevated slightly to place the interior of it in communication with the space surrounding the casing. The pressure of the mud fluid on the cement caused the latter to move upward in the space outside the casing and seek its level with the fluid level in the casing. The casing then was lowered to the bottom, entrapping the cement in the space surrounding the casing, and the cement remaining in the casing was bailed out.

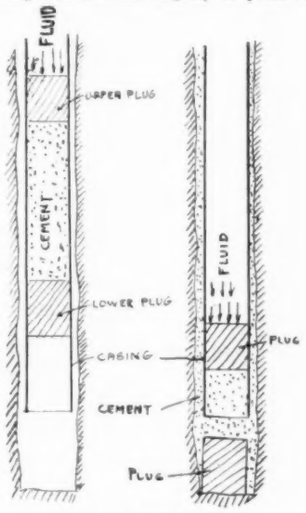

Diagram of Perkins Process.

This and various other methods similar to it and the Perkins method made their appearance about this time showing that the cementing problem had become acute.

In 1911 R. C. Baker, of California, developed a tubing method of cementing wells under pressure. Baker provided a cement retainer having a back pressure valve, which was lowered into the casing at the end of tubing. This retainer was secured above the lower end of the casing, which was above bottom and was fitted with a packer so as to plug the casing. Cement then was pumped downward through the retainer, the pressure opening the valve so that the cement would be discharged and forced upward around the casing. When the pressure was relieved, the back pressure valve closed, preventing the cement from returning into the casing. The retainer then was drilled or broken out and the drilling continued. Mr. Baker was granted a patent on his cement retainer in 1912.

Shortly afterward Mr. Baker produced what is known commercially as the Baker Sure-Shot plug. This cement plug and the method of cementing with it are designed especially for use where expert cementing service is not available and where wells are drilled with cable tools.

In using the Baker cement plug, the

Leak-proof tanks and pressure vessels—by oxwelding

ALL riveted storage tanks and pressure vessels develop leaks ultimately. Every year thousands and thousands of dollars' worth of volatile liquids evaporate from storage vessels even though the riveted vessels may appear tight when tested. Oxwelded vessels on the other hand are actually and permanently leak-proof.

That is why oxwelded tanks and pressure vessels have become popular.

A test was made recently on a welded tank five feet in diameter and forty-three feet long, made of inch and one-eighth steel with double-vee oxwelded joints. The vessel was designed on the basis of a fibre stress of 8,000 lb. per sq. in., but when the test pressure was raised to 1,000 lb., the testers were applying a pressure equal to three times the working pressure (based on a design fibre stress of 9,000 lb. per sq. in.). Two tests at this pressure showed practically no distortion except around the manhole. It was then tested to destruction, and failed through the manhole. Examination proved that the welds were in no way affected.

It would be impossible to make such a high proof test on riveted pressure vessels because the riveted seams spring leaks long before the walls or the heads are severely stressed. But it is now possible to test even the head construction and design, since oxwelded joints and seams are as strong as the metal walls themselves.

Linde Procedure Controls explain in detail the construction of pressure vessels with Oxweld No. 1 High Test rod.

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Unit of Union Carbide and Carbon Corporation

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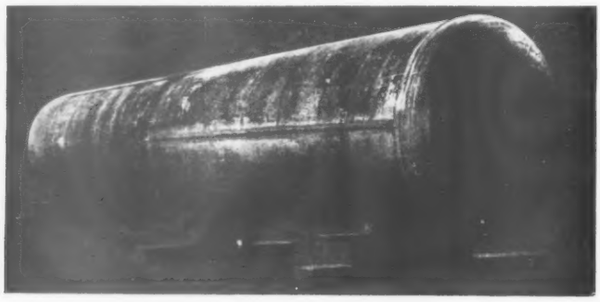
30 East 42d Street, New York

37 PLANTS . . . . . 105 WAREHOUSES



LINDE OXYGEN

Portability

Repair jobs do not respect convenience. On one side of the plant there is a steam leak that must be stopped quickly by oxwelding. Or, a machine breaks on the other side of the plant. Again a hurry call for the welder. Time after time oxwelding equipment must be transported with speed.

Then the convenience of moving a cylinder of Prest-O-Lite dissolved acetylene becomes apparent. The WK cylinder contains about 270 cubic feet of gas and weighs much less than even the smallest welding type generator; the WC size (100 cu. ft. capacity) offers a still greater factor of portability. That is why cylinders are always used where portability is essential.

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DISSOLVED ACETYLENE

Oxweld's Banner Year

1927 was the biggest year in Oxweld's history and Oxweld is proud of it. This means that the reputation established by Oxweld equipment during the last fifteen years is substantial.

And in 1928 more people than ever before will buy Oxweld injector blowpipes, Oxweld regulators. Oxweld welding rods and fluxes.

These increased sales, demand increased service. Oxweld is to give increased service to greater numbers than ever before—service that will help them use Oxweld equipment efficiently and economically.

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Unit of Union Carbide and Carbon Corporation

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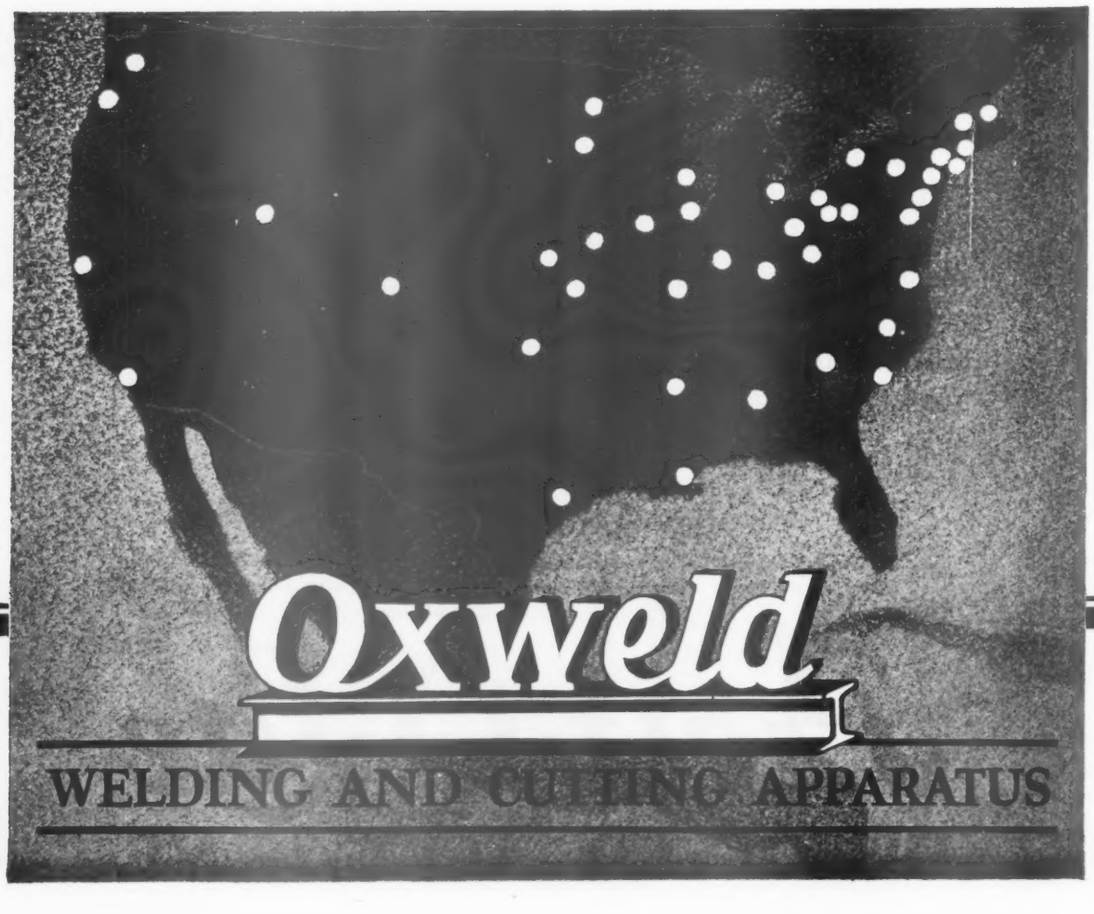
STOCKS IN 39 CITIES



casing must be free and circulation established. The amount of cement necessary is first estimated and the proper quantity is deposited in the bottom of the hole by means of a dump bailer. The casing then is raised above the level of the cement and the cement plug is run down through the casing.

The cement plug is a hollow cast-iron plug with a body portion of a diameter slightly less than the interior diameter of the casing and having a torpedo-shaped lower end fitted with a valve which is held open while the plug is lowered so that the plug can be run through fluid. The plug is run through the casing and then drawn back into the end of the casing. This latter operation closes its valve and tightly secures the plug in the end of the shoe, plugging the lower end of the casing. The casing then is lowered into the cement as if setting a pile and it displaces the cement in the hole, forcing it upward around the casing. After the cement has set the plug is drilled out and the drilling proceeded with. This cement plug was patented by Mr. Baker in 1913.

Another Plug Appears

After 1920 the McLaine plug made its appearance. It was invented by William McLaine of California. It is a hollow plug secured at the lower end of the casing and fitted with a back pressure valve so that the casing can be floated into place in the hole and cement forced downward through the casing and out of the valve. This valve is opened by the pressure of cement but automatically closes when the pressure is relieved, trapping the cement outside the casing. A patent was granted in 1924.

During the period between 1911 and 1924 a number of patents were issued on cementing apparatus, but their principle of operation differs slightly from those here described.

The latest of what may be considered important advances in cementing apparatus was invented by Donald Burch of Oklahoma and recently patented by him. Mr. Burch conceiving a floating and cementing apparatus made of cement, so that when it is broken out no metal will remain in the hole to injure core drills or other tools. Mr. Burch's device operates like McLaine's but his entire structure is of non-metallic friable material, eliminating danger of injury to tools used after drilling out the plug.

The patent office discloses practically a complete record of the development of well-cementing processes and apparatus. In selecting the processes and devices which are considered fundamentally different, the success that they have attained in practice was given consideration.

Several refinements in devices practicing practically the same methods as here outlined have been patented and have met with certain success in the field, but these patents for the most part pertain to improvement in apparatus design only.

BOUNDARIES IN PECOS ARE BEING ESTABLISHED

SAN ANGELO, Tex., Jan. 16.—Efforts to establish definitely the boundaries of Sections 107 and 108, T. C. Railway Co. Survey, and adjoining sections in the northwest part of the Eastern Pecos County oil field are being made at a conference between land and royalty owners and representatives of companies holding leases in the area.

Recent surveys, it was stated, have indicated that Section 107 lacks the 315 acres credited to it on most maps. It is south of Section 108, on which Kirby and Edson Petroleum Companies have a producer, and adjoins on the west Section 101, under lease to Transcontinental, and Section 34½ (vacancy strip), on which McMan and Marland Oil Companies have 14 producers. These and other properties would be affected by any changes in boundaries.

Engineers are to confer with attorneys, and it may be some time before results are announced.

A. J. Cunningham of the land department of the California Co., is presiding.

RECEIPTS OF CALIFORNIA OILS AND IMPORTS OF PETROLEUM

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the month of December totaled 2,452,000 bbls., a daily average of 79,097 bbls., compared with 1,970,000 bbls., a daily average of 65,667 bbls. for the month of November.

Receipts at Atlantic and Gulf Coast ports for the week ended January 7 totaled 75,000 bbls., a daily average of 10,714 bbls., against 561,000 bbls., a daily average of 80,143 bbls., for the week ended December 31.

	Total		Week Ended	
At Atlantic Coast Ports—	December	November	Jan. 7	Dec. 31
Baltimore	333,000	283,000	.....	.....
Boston	94,000	85,000	.....	.....
New York	938,000	*999,000	.....	233,000
Philadelphia	756,000	455,000	75,000	235,000
Others	219,000	148,000	.....	93,000
Total	2,340,000	1,970,000	75,000	561,000
Daily average	75,484	65,667	10,714	80,143
At Gulf Coast Ports	112,000	.....	.....	.....
Daily average	3,613	.....	.....	.....
Total Atlantic and Gulf Coast Ports	2,452,000	1,970,000	75,000	561,000
Daily average	79,097	65,667	10,714	80,143
Distribution of total California receipts is as follows:				
Crude	701,000	*883,000	.....	159,000
Gasoline	1,055,000	*706,000	75,000	255,000
Kerosene	165,000	.....	.....	73,000
Gas oil	148,000	*241,000	.....	74,000
Fuel oil	326,000	140,000	.....	.....
Lubricants	57,000	.....	.....	.....
Total	2,452,000	1,970,000	75,000	561,000

*Revised.

According to figures collected by the American Petroleum Institute, imports of crude and refined oils at the principal ports for the month of December totaled 5,898,000 bbls., a daily average of 190,258 bbls., compared with 6,574,000 bbls., a daily average of 219,133 bbls. for the month of November.

Imports at the principal United States ports for the week ended January 7 totaled 1,583,000 bbls., a daily average of 226,143 bbls., compared with 837,000 bbls., a daily average of 119,571 bbls. for the week ended December 31.

	Total		Week Ended	
At Atlantic Coast Ports—	December	November	Jan. 7	Dec. 31
Baltimore	1,239,000	1,057,000	76,000	75,000
Boston	74,000	241,000	.....	.....
New York	2,448,000	2,536,000	633,000	385,000
Philadelphia	592,000	903,000	319,000	75,000
Others	925,000	812,000	382,000	*222,000
Total	5,278,000	5,549,000	1,410,000	757,000
Daily average	170,258	184,967	201,429	108,142
At Gulf Coast Ports—				
Galveston district	80,000	120,000	.....	*40,000
New Orleans and Baton Rouge	476,000	795,000	131,000	40,000
Port Arthur and Sabine district	26,000	60,000	.....	.....
Tampa	38,000	50,000	42,000	.....
Total	620,000	1,025,000	173,000	80,000
Daily average	20,000	34,167	24,714	11,429
At All United States Ports—				
Total	5,898,000	6,574,000	1,583,000	837,000
Daily average	190,258	219,133	226,143	119,571

*Revised.

W. C. TEAGLE IN TEXAS ON HUNTING VACATION

HOUSTON, Tex., Jan. 14.—Walter C. Teagle, president of the Standard Oil Co. of New Jersey, spent Thursday at offices of the Humble Oil & Refining Co. at Houston, Tex. He made no special statement, explaining that he was on a vacation from his office and probably would have something of interest to make known when he returned to New York the first of the month. However, he expressed some confidence in the future oil outlook.

He left Thursday night with a party of Humble officials for a hunt in southwestern Texas.

AL SMATHERS FATALLY STRICKEN BY ILLNESS

Elmer E. Smathers, multimillionaire oil operator, real estate owner and oil field supply manufacturer, died in a Los Angeles, Calif., hotel Wednesday evening, January 11. He had been in good health up to the evening he was stricken with a brain hemorrhage, and his death was instantaneous. Mr. Smathers made his home in New York and Port Chester, L. I., but had gone to Los Angeles to remain through the winter.

"Al" Smathers was one of the best known and most picturesque of the many men who have engaged in the oil business in its 69 years of history. When a young man he was a lease pumper in the Bradford Field, but he was an ambitious youth and soon graduated out of that job. At 25 he was a member of the Bradford Oil Exchange and became a heavy trader in crude oil, dealing also through brokers in the New York, Pittsburgh and Oil City exchanges. Later he became a member of the Pittsburgh Stock Exchange, after which he moved to New York, where he established headquarters for a string of brokerage houses that extended into several states. He was represented on the floor of the New York Stock Exchange by Charles M. Dodge and others.

Making money was easy for Mr. Smathers and his fortune piled higher and higher. He was a partner of C. B. Shaffer and of Dale K. Shaffer in Mid-Continent oil operations. Smathers owns the land under which the large addition to the Standard Oil Co.'s original building in New York stands, and he was the owner of the Lyric Building and lot on West Forty-second Street, where recently he made arrangements to build a huge office building. He had other extensive holdings in New York City and on Long Island.

Mr. Smathers was the principal owner of the Bovaird & Seyfang Manufacturing Co.'s big plant in Bradford, Pa. Recently he made a gift of $30,000 to the First Methodist Episcopal Church of that city as a memorial to his mother.

LA.-ARK. WILDCATS

(Continued from Page 52)

line to St. Louis as well as for other markets, it has two tests going past the gas horizon prospecting for oil.

Mississippi Activities

In Mississippi, Amory Natural Gas Co.'s No. 1 Hill, Section 12-13-18, has resumed drilling after fishing out tools that halted drilling for four months and has made 140 feet more hole, total depth as of January 9 being 2,372 feet. At this depth the hole is said to be 96 feet lower than the gas in its Carter gasser in Section 7-13-17, but as there have been no signs of water the operators, Canadians, are not unduly pessimistic. Until the last 23 feet they have been drilling brown shale with streaks of sand. It is planned to drill to 3,500 or 4,000 feet before abandoning the wildcat, it is learned.

Moody & Seagraves' No. 1 Whitesides, Section 16-9-7, Lee County, 9 miles northeast of Tupelo is setting 6-inch casing at 2,140 feet, total depth 2,300 feet.

Transcontinental Oil Co. and The Texas Company's No. 1 Day, Section 18-16-18, Monroe County, is hauling 8-inch casing to set at 1,817 feet.

A. M. Sutton has changed to cable tools and is drilling Alcorn Petroleum Co.'s No. 1 Matthews, Section 14-2-7, Alcorn County, at around 675 feet and is moving in cable tools to resume drilling No. 1 Acker in Section 25-13-19, Monroe County, which has been shut down for some time at about the same depth.

NORTH LOUISIANA

Bienville Parish

E. J. Forrest's No. 1 Berritt, Section 11-17-6, shut down at 2,600 feet last week, is drilling chalk at 2,702 feet. Louisiana Petroleum Co. has a fishing job at 2,800 feet in No. 1 Hays, Section 18-16-5, where it was drilling when several joints of drill stem twisted off.

Bossier Parish

Doern and others' No. 1 Bollinger, Section 9-22-11, is drilling at 3,498 feet in broken sand and shale. Hamiter and others' No. 1 Hamiter, Section 10-23-13, is drilling at 1,560 feet. Walker and others' are shut down at 2,820 feet on No. 1 Antrim, Section 28-22-13.

Caddo Parish

Arkansas Natural Gas Co. is in gumbo at 2,240 feet in No. 1 Alexander, Section 20-16-15. Greenwood Production Co.'s No. 1 Cooper & Ellerbe, Section 15-18-14, is reaming to bottom at 2,749 feet. Woodley & Collins' No. 1 McVey, Section 23-19-14, is drilling at 2,600 feet.

Catahoula Parish

Lochnager Oil & Gas Co. has made location for No. 3 Beasley, 660 feet north and 132 west SE cor. NW SW Section 26-9-6, three locations north of No. 2 on the same lease, abandoned two weeks ago as a salt water hole at 3,112 feet. Standard Oil Co. is trying to loosen drill stem stuck at 3,459 feet in No. 1 Tensas Delta, Section 23-8-5.

Claiborne Parish

Magnolia Petroleum Co.'s No. 1 Lee, Section 16-22-8, cored hard lime and shale at 4,930 feet.

DeSoto Parish

Benson Oil Co. began drilling No. 2 Wolff, Section 3-10-13, January 8, set 200 feet of 10-inch casing and is drilling at 300 feet. Dixie Oil Co.'s No. 1 Jenkins, Section 9-12-11, is drilling lime at 5,950 feet. Foster and others' are drilling No. 1 Johnson, Section 7-10-13, at 2,300 feet. Reliance Drilling Co. has gone back to No. 1 Jones, Section 8-11-14, standing with 6⅝-inch casing cemented at 2,785 feet since July 20 last year, and is drilling plug, total depth 2,815 feet.

Franklin Parish

Pittsburgh Oil & Development Co.'s No. 3 Moore, Section 12-11-6, which has been shut down waiting orders since December 7, after a salt water test at 2,227 feet, is drilling at 2,300 feet.

Madison Parish

W. S. Smith, who took over No. 1 Yerger in Section 51-16-14 from Bannon and others' who had drilled it to 1,690 feet, has rigged up to deepen and is fishing for drill stem as his first activity.

Natchitoches Parish

Lawson & Pharis began drilling No. 1 Crowell, Section 22-5-6, January 5, set 10-inch at 50 feet and are drilling at 400 feet.

Sabine Parish

S. P. Borden and others' are shut down waiting orders with No. 1 Logan, Section 36-10-13, after testing dry at 3,304 feet. Dixie Oil Co.'s No. 1 Steinfelt in Section 20-10-12, drilling at 2,980 feet. L. M. Emlet's No. 7 Bowman-Hicks, Section 14-7-14, cored lime at 3,718 feet and No. 1 Mansfield Lumber Co., Section 15-7-14, is drilling second hole at 525 feet after being shut down since December 7 at 475 feet. Seip and others' are down 3,140 feet with No. 1 Moore, Section 33-10-12, drilling.

Webster Parish

S. A. Lane has shut down No. 1 Miles, Section 24-17-9, at 1,469 feet.

West Carroll Parish

The Palmer Corp.'s No. 1 White, Section 2-19-10, is drilling a chalky formation at 2,764 feet.

Winn Parish

Ohio Oil Co.'s No. 2 Rolan, Account 1,

Don't put "transients" in your pipe lines

INSTALL valves you can forget—valves that prove their true economy by giving years of trouble-free service.

Put in genuine Jenkins Valves. Make sure the Jenkins "Diamond" is on every one. This mark protects engineers in the oil industry from valves in the "transient" class.

A Jenkins Valve has reserve strength. It must have reserve strength to make good in service tests before it leaves the Jenkins factory. It is strongly built and well designed for the service for which it is recommended. Metals used are proved by analyses before and after casting.

There is a genuine Jenkins Valve for practically every valve requirement. At supply houses everywhere.

You can obtain, when you so order, Jenkins Valves specially packed and tested for oil service.

Fig. 370
Screwed, Jenkins Standard Bronze Gate Valve

Fig. 352
Screwed, Jenkins Standard Bronze Swing Check Valve

Fig. 325
Screwed, Jenkins Standard Iron Body Gate Valve

Fig. 142
Flanged Jenkins Standard Iron Body Globe Valve

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Section 5-12-1w, is drilling sandy shale at 3,655 feet.

ARKANSAS

Clark County

McKenzie Oil Co., drilling No. 1 Eakin in Section 9-11-19, have run into a sand at 644 feet and are arranging to set 6-inch casing to make a test of the 1 foot of sand found, total depth 650 feet.

Columbia County

Sunny Jim Oil Co. is arranging to plug back for a test of No. 1-A Runyon, Section 3-16-21, at 2,751 feet, total depth 2,950 feet.

Franklin County

Empire Gas & Fuel Corp.'s No. 1 Patrick, Section 19-11-27, with 15½-inch casing set at 469 feet and 12½-inch at 838 feet lost cable tools and 2,400 feet of cable in the hole and is fishing, total depth, 3,495 feet.

Miller County

Guest and others' are drilling gumbo at 2,425 feet in No. 1 Saunderson, Section 14-15-26.

Nevada County

McDonald and others' No. 1 Pelt, Section 9-15-22, is shut down in red beds at 2,424 feet waiting orders.

Union County

W. R. Keever has recommended 6⅝-inch casing at 2,166 feet in No. 5 Ezell, Section 12-17-15, the first job failing to hold. Lion Oil Refining Co.'s No. 1 Horn, Section 17-17-13, is shut down for fuel, total depth 3,175 feet, having found the sands paying off in Champagnolle Pool barren. Pitcher and others' No. 1 Arkansas Timber Co.'s Section 21-17-11, is drilling at 2,000 feet and No. 1 Kinard, Section 17-15-19, is drilling at 2,505 feet after a salt water test a few feet above.

Poinsett County

Aarnes and others' No. 1 Aarnes, Section 23-10-6, is drilling at 2,500 feet.

Pope County

Natural Gas & Fuel Co. set 12½-inch surface string at 373 feet in No. 1 Whorton, Section 7-8-21, and is drilling at 1,675 feet.

EAST TEXAS

Caddo County

Hickman and others' have made location for No. 1 S. M. Mott in the Ambrose Douthitt Survey and are rigging up to drill. The Texas Company's No. 1 Pruitt in the W. S. Lissenbee Survey began drilling January 9 and hit a hard rock at 126 feet.

Shelby County

Magnolia Petroleum Co. is drilling lime rock at 3,475 feet in No. 1 Pickering Lumber Co., in the W. J. Crane Survey.

SOUTHWEST TEXAS

(Continued from Page 50)

head, SE SE Section 30, Block 4, has been abandoned dry at 2,925 feet.

Webb County

W. O. Wheatley's No. 2 Reiser, Survey 1,617, Block 8, Reiser Field, has been abandoned at 400 feet.

New Locations

Livingston and others' No. 1 Puig, Block 5, Aviator Field, in Webb County, has derrick up.

J. A. Harper's No. 1 Rout, Live Oak County, is location 1,500 feet to west line and 150 feet to south line.

Green & Shall's No. 2 Dubose, Gonzales County, is location in the J. Pratt Survey.

M. W. Koenig's No. 5 Tiller, Luling Field, Caldwell County, is location in the John Henry Survey, 250 feet north of the No. 4.

Humble Oil & Refining Co.'s No. 5 Kleberg, Lot 8, Section 40, Kingsville Field, in Kleberg County, is location 150 feet to west and south lines and is northeast offset to No. 2 Flato; No. 6 Kleberg, Lot 1, Section 40, is location 450 feet to north line and 150 feet to east line.

Morgan-Walsh's No. 1 Haby, Survey 50½, Medina County, southwest of Dunlavy, has spudded.

Southern Gas-Witherspoon Oil Co.'s No. 8 Nixon, east of the No. 1 in the Adams gas field in Medina County is at 130 feet and erecting derrick for rotary.

Witherspoon Oil Co.'s No. 1 West, Zavala County, is location, arrangements being made to drill, 200 feet southeast of the Sun Oil Co.'s well, drilled several years ago.

Larson-Walsh and others' No. 1 Oppenheimer, Survey 180, Bexar County 18 miles southwest of San Antonio, has been spudded, location 330 feet to south line of survey and farm and 330 feet to center of east line of survey.

Lumberman's Oil Co.'s No. 2 Milgrim, Atascosa County, Survey 79, is location; No. 1 Williams, Survey 275, Section 92, Atascosa County, is location; No. 1 Stephens, Survey 6, Section 281, Atascosa County, is location.

Sam Draper's No. 1 McCoy, W. S. Stilwell Survey, west central part, Atascosa County, is location.

Cole Gas Field—Duval

Morgan-Humphreys' No. 1 King-Harper Survey 323, 150 feet to west line and 422 feet to NE cor. of Survey 319 has been spudded in. Houston Oil Co.'s (Humble) No. 1 Juan V. Cuellar, Share 1, Cuellar grant, 3,300 feet to southwest lines and 2,324 feet to southeast lines, at 2,330-01 feet tested small amount of gas and at 2,331-33 feet tested dry and is coring ahead. Houston Oil Co.'s (Sun) No. C-3 Benavides, Blocks 77, 78, 127, 128, is drilling at 975 feet in shale. Cole Petroleum Co.'s No. 50-B Benavides, Survey 5, Block 7, located 611 feet to northwest lines and 625 feet to northeast lines, is drilling at 2,732 feet.

Humble-Reiter-Foster Field

Humble Oil & Refining Co.'s No. 7 Kohler, Survey 164, located 200 feet to north and west lines, has rigged up.

Piedras Pintas Dome

Humble Oil & Refining Co.'s No. 7 Walsh, Survey 185, located 2,050 feet to east line and 1,750 feet to north line, at 4,423 feet is fishing for part of tester.

Driscoll Gas Field

Robert Driscoll's No. 9 Driscoll, Survey 23, located 1,750 feet to west line and 2,000 feet to south line, has set casing at 198 feet; No. 10 Driscoll, Survey 448, located 850 feet to east line and 2,300 feet to south line, has rig up.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 32 Merchants State Bank, Survey 415, located 850 feet to west line and 2,100 feet to north line, is drilling at 2,875 feet; No. 33 Merchants State Bank, Survey 415, is location 2,400 feet to west line and 1,690 feet to north line.

Henne, Winch & Fariss Pool

Magnolia Petroleum Co.'s No. 17-A Martinez, Survey 256, located 860 feet to north line and 550 feet to east line, at 2,088 feet, is moving in to deepen. Edwards St. Albans' No. 9 Lopez, Share 1, Block 6, located 291 feet to east line and 180 feet to south line, is drilling at 800 feet.

Alworth Field

Alworth-Stevens-Hild's No. 11 M. Garza, Survey 39, Block 10, located 310 feet to northwest lines and 460 feet to southwest lines, is location, also 600 feet southwest of No. 10.

Reiser Field—Webb

Ritchison and others' No. 1 Wheatley, Survey 1,570, Block 2, is location. W. O. Wheatley's No. 2 Reiser, Survey 1,617, Block 8, located 150 feet to south and east lines, has been spudded in.

Leaseholders Field

J. H. Winch's No. 1 A. E. Gates, Survey 70, located 1,470 feet to south line and 1,170 feet to west line, is moving on.

Carolina-Texas Field

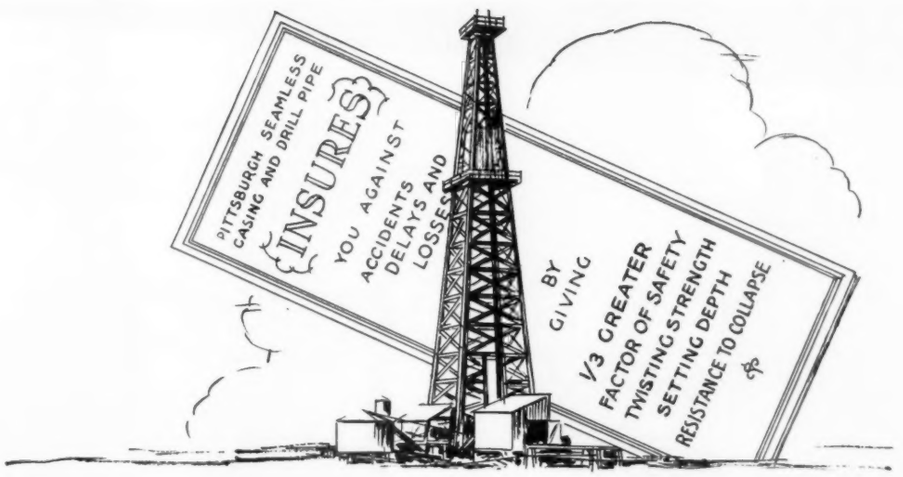
Houston Oil Co.'s No. 3 S. Benavides, Survey 683, located 350 feet to north line and 1,470 feet to east line, at 3,014 feet is rigging up to deepen. Serna-Forrest's No. 1 Benavides, Survey 2,272, Block 2, located 150 feet to north line and 200 feet to east line, is drilling at 1,500 feet.

Cole Gas Field No. 2

Cole Petroleum Co.'s No. 51 Benavides, Survey 412, Block 5, located 160 feet to north line and 150 feet to west line, is drilling at 97 feet.

Luling Field—Caldwell

Magnolia Petroleum Co.'s No. 16 O. F. Stair, John Henry Survey, 300 feet southwest of No. 14, is drilling at 800 feet; No. 11 W. J. Tiller, John Henry



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The use of Pittsburgh Seamless Steel Casing and Drill Pipe is the best single step you can take to insure continuous, economical drilling and the successful completion of wells.

Pittsburgh Seamless is made of higher carbon, stronger steel than is possible in welded pipe. Every inch of weld in a welded tube is a point of potential failure. That is why actual tests prove Pittsburgh Seamless to have a one-third greater factor of safety. It can be furnished in all sizes up to 13⅜" diameter.

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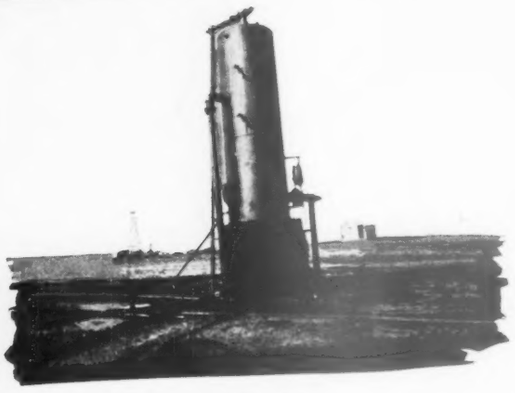

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The Smith Separator delivers the full casing head gravity to the stock tank (1° saved in gravity equals 2% in volume). You can easily figure the increase in your volume with a Smith Separator installed.

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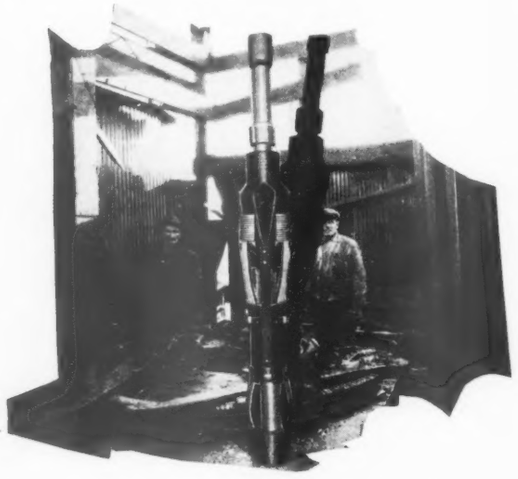
A Tubing accident is costly—the EverReady Protector is a pre-cautionary measure that will save the money you might lose It is absolute protection against tubing accidents.



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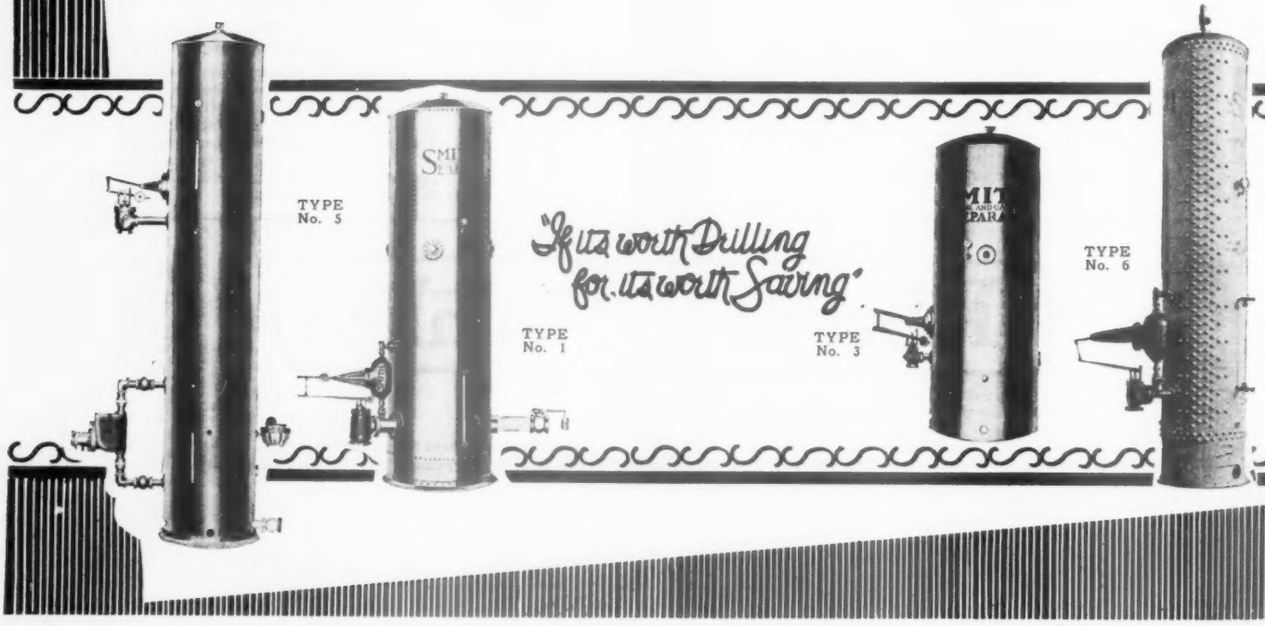
320 Couplings installed in 270 minutes is obviously money saved. The contractor on this job wrote "In all my twenty-six years experience, I have never found a coupling that could be so easily connected and yet so efficient" (400 pounds pressure was put on this line without any leaks showing up).



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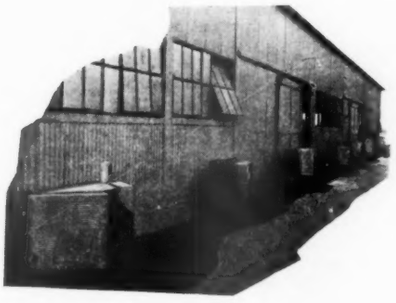
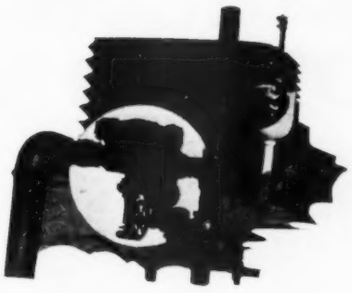
Experience has proven that there is saving wherever "man labor" can be replaced by an automatic regulator or control valve. There is a Fisher specialty for any need you may have—or one will be made to suit—Smith Separator engineers will advise you . . . . write us.

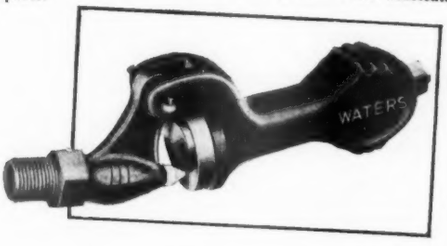




Fisher Type 295 Back Pressure Control Valve.

REED AIR FILTERS

Depreciation and wear is the uncertain but inevitable loss that must be written off each year—even on the best equipment. A Reed Air Filter installed on the intake of your compressor or engine stops the grit and sand sucked in that scores the cylinders, clogs the valves and carried through by the oil would quickly wear bearings and other lubricating parts.



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Sixty seats on a reversible gasket—means double the life—half the cost—twice the efficiency—if it's a Waters Gauge Cock

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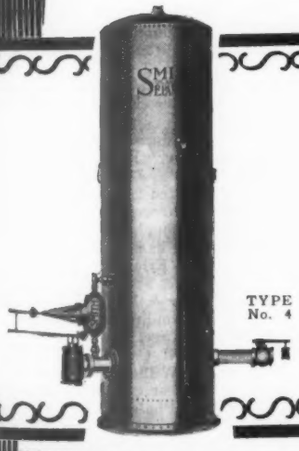
We can help you bring to the countenance of your stock holders that pleased and satisfied look when dividends are paid. Their confidence in your management and the security of their money is helped materially by equipment that pays for itself and earns a profit.



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30 Church St.
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TEXAS OFFICES
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Houston, Texas
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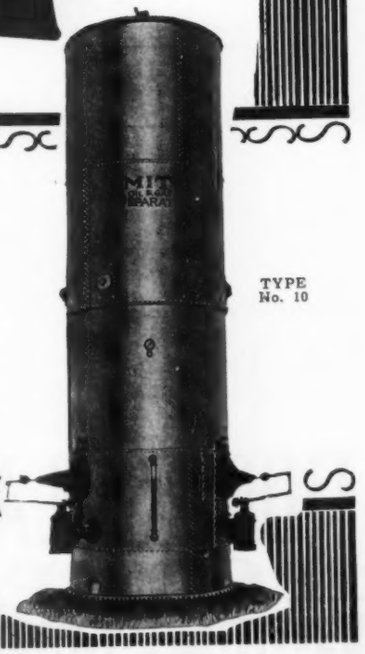
Fort Worth, Texas



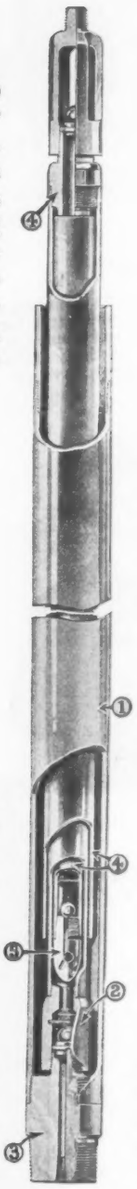
TYPE No. 10

FLUID PACKED PUMP

FPP

Reduces ROD JOBS

The FLUID PACKED PUMP eliminates recupping because it has no cups. It does away with relining because there are no packing, no close-fitting, wearing parts—nothing to wear out except balls and seats.



RIGID TYPE

Originally designed for pumping wells abandoned because of severe conditions of sand, shale, etc., the FLUID PACKED PUMP has proven its dependability in world-wide successful use.

Furnished in Rigid Type, and in Removable Type which pulls with rods.

Manufactured *only* by the Fluid Packed Pump Co., Los Neitos, Calif.

Distributed in the Mid-Continent by Robert N. Atmore Co., Tulsa, Okla.

ROBERT N. ATMORE COMPANY

FLUID PACKED PUMPS

Survey, is location 300 feet southwest of No. 5. Pat M. Armstrong's No. 1 Hardeman, Miles G. Dykes, Survey 150 feet to northwest and southwest lines of farm, is drilling at 600 feet. North & South's No. 1 Kelly is drilling at 7,268 feet; No. 2 Tiller is drilling at 6,815 feet.

Adams Gas Field—Medina

Southern Gas Utilities-Witherspoon Oil Co.'s No. 5 Adams is location 1,400 feet north of the No. 4. Witherspoon Oil Co.'s No. 1 Tidal lease is location in the western part of the field. Lange & Jarmon's No. 1 Adams, Survey 71, located 500 feet to north and west lines, is shut down at 60 feet.

Saxtet Gas Field—Nueces

Alamo Drilling Co.'s No. 1 Gallagher, 10 miles southwest of Corpus Christi on the old Brownsville road, is rigging up. Saxet Oil Co.'s No. 3 Meaney has set casing at 2,322 feet. Perry and others' No. 1 State Land has set 10-inch casing at 468 feet.

Refugio Gas Field—Refugio

Coast Gas Co.'s No. 2 Shelly is drilling at 2,415 feet in gumbo. Houston Oil Co.'s No. 4 Rooke at 2,634 feet cored sand; No. 8 W. J. J. Heard at 3,216 feet is drilling in gumbo; No. 1 Smith Heard is rigging up to deepen; No. 11 Heard is waiting on cement at 2,658 feet; No. A-2 Rooke is drilling at 2,600 feet. Houston Gulf Gas Co.'s No. 2 Ryals is rigging up; No. 1 Tom O'Connor is in gumbo at 810 feet; No. 1 Vance at 2,623 feet has water sand; No. 5 Fanny Heard is in sand at 3,276 feet; No. 6 Fanny Heard is deepening from 2,405 feet to the 3,300-foot sand; No. 3 A. W. Heard has set surface casing at 400 feet; No. 4 A. W. Heard is drilling at 2,510 feet; No. 1 Smith Heard is standing at 2,510 feet.

White Point Gas Field—San Patricio

Houston Oil Co.'s No. 3 Humble is rigged up; No. 4 Humble is drilling at 2,306 feet; No. 5 Humble is location; No. 2 Ragsdale is drilling at 2,304 feet in gumbo; No. 3 Ragsdale is location. Mission Drilling Co.'s No. 1 Morris is drilling at 2,150 feet; No. 1 Hunter at 1,900 feet tested 600 pounds rock pressure through drill stem and is being completed. Houston Gulf Gas Co.'s (formerly William F. Morgan and others) No. 1 Welder is setting surface casing at 500 feet. Saxet Oil Co.'s No. 2 White Point Development Co. is drilling at 1,975 feet; No. 3 White Point Development Co. is location; No. 8 Rachal is drilling at 2,534 feet; No. 9 Rachal is drilling; No. 10 Rachal is standing at 400 feet; No. 12 Rachal is drilling in; No. 7 Dunn is location; No. 8 Dunn is location; No. 9 Dunn is location; No. 1 Henry is location; No. 1 Hunter is waiting on water.

SOUTHWEST WILDCATS

(Continued from Page 50)

drilling at 2,300 feet. It found the chalk a little high and unless other formations thicken up should get the Edwards high and stand a show of opening another field. North & South's well is producing about 1 bbl. a day from the chalk.

Sun Oil Co.'s No. 1 Washburn in eastern LaSalle County, a location made after drilling many diamond core shallow formation tests, is now drilling at 3,908 feet and has had very little encouragement in the way of indications of oil. Unless it shows up something soon, it will probably be abandoned. Another test that thus far has been disappointing is No. 1 Barfield of Walker-Van Duyn in Kerr County, at Center Point. At 1,803 feet it has no indications of oil and at that depth in No. 1 Leigh the same people had a showing which they were in hopes would amount to more than a showing in this. The well i shut down.

Duval County

Miko E. Trussell, Trustee's No. 1, Moody, Survey 60, located 175 feet to west line and 150 feet to north line, at 2,415-23 feet in sand tested 2,150 feet fluid 3 fourbles sand, 450 feet oil and is setting casing. National Oil Co.'s No. 1 Ball, Survey 16, located 450 feet to north line and 150 feet to east line, has resumed drilling at 40 feet.

Jim Hogg County

Paesano Oil Syndicate's No. 1 Campbell, Las Vivoritas Grant, in sand at 3,030 feet and testing through drill stem. T. G. Shaw's No. 1 Jones, Survey 381, Block 12, located 171 feet to south line and 486 feet to west line, is standing at 1,020 feet.

Starr County

Kusch Exploration Co.'s No. 1 Frank Doyno and others', Porcion 75, Block 13, is drilling water well. Clark & Woodruff's No. 1 Kelsey, Porcion 76, 75, 77, is standing at 503 feet, previous report in error. J. E. Harston's No. 1 H. Guerra, Survey 43, located 660 feet to south line and 1,320 feet to east line, is standing at 500 feet.

Atascosa County

Eckert and associate's No. 1 C. T. Tom, 2,500 feet to north line of farm and 2,700 feet west of highway, has resumed drilling.

Bastrop County

Noack & Laning's (Kelly) No. 1 Roemer, Isaac Casner league, 150 feet to NE cor., is shut down at 1,935 feet. Young & Owens' No. 1 Ed Jones, 9 miles west of Bastrop, is moving on.

Bee County

D. Hewitt's No. 1 G. A. Ray is shut down at 2,303 feet; No. 1 Schultz, is rigging up. F. Nichols' No. 2 Hicks & Hall, 100 feet north of No. 1, is rigging up. Red Ant Oil & Gas Co.'s No. 1 Perry & Chesnutt, B. Q. Hadley Survey, at 805 feet is moving in new rig and will resume drilling.

Blanco County

C. W. Bates' No. 1 Herman Massey, Henry Manton Survey, 920 feet to north line and 660 feet to east line, has derrick up and rig ordered out. Robert A. Rodson's No. 1 Glasscock, Survey 50, located 150 feet to CEL, has derrick up and roads so bad that rig could not get in.

Caldwell County

Joseph Bruner's No. 1 Wilson, A Floyd Survey, 2,320 feet to east line and 200 feet to south line, is location. Dickinson & Smith's No. 1 Martin Callahan, Willard Cooper Survey, is drilling at 1,905 feet in top of chalk. Dr. Butte and others' (formerly John S. Storey) No. 1 Mrs. Thomson, John Lawrence Survey, is drilling at 1,000 feet. The Texas Company's No. 1 Robuck, Ben McCulloch Survey, 1,200 feet to southwest lines and 600 feet to southeast lines, is drilling at 700 feet.

DeWitt County

Empire Southern Oil Co.'s No. 2 Smith, Survey 3, located three-fourths mile west of No. 1, is shut down at 2,960 feet. Durbing Oil Co.'s (formerly Williams & Gates) No. 1 Gohmert, G. W. Brooks league, is drilling at 900 feet. H. T. Roe No. 1 Lienhard, D. J. Bibb Survey SW cor., is shut down at 95 feet.

Dimmitt County

Humble Oil & Refining Co.'s No. 1 City National Bank, Survey 654, located 700 feet to north line and 2,000 feet to east line, is at 4,468 feet waiting on casing.

Edwards County

Devil's River Oil & Gas Co.'s No. 1 Ferney C. C. S. D. & R. G. N. G., Section 167, located 2,640 feet to north line and 660 feet to west line, at 400 feet had oil showing thought good for 2 to 3 bbls., and no report has been made since.

Frio County

F. A. Lain & F. A. Brown's No. 1 Edwards, Hooper & Wade Survey, 920 feet to CNL, is standing at 1,250 feet.

Fayette County

National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams League No. 1, is location 300 feet to north and east lines. Williams & Phalon's No. 1 Cervenka, Fayette County school land Block 97, is location in SE cor. of farm.

Gonzales County

L. L. Jones and others' No. 1 Campbell, Moore & Bridges Survey, SW cor. is preparing to core at 1,980 feet.

Hays County

Oren Estes & H. J. Moore's No. 1 C. N. Sledge, 1 mile from Kyle, has derrick material on the ground. J. E. Rodg-

Leading Oil Companies Are Standardizing on the Improved

WICO MAGNETO

IN August, 1927, announcement of the self-lubricating WICO OC MAGNETO was made to the oil industry. For eight months test magnetos had been running steadily under field conditions—a total of some 5,700 hours—without oiling, adjusting or servicing.

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YOUR PRESENT WICOS
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Your present type OC magnetos can have all the new features added to them. Next time repairs are needed, the changes will be made for an additional charge of only one dollar.

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We would like to give you the interesting details and full information regarding the improved WICO. Just fill in and mail this coupon.

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Please send me full details regarding the new WICO OC Magneto. We have WICO MAGNETOS. How can they be converted to the new type?
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WICO ELECTRIC COMPANY, SPRINGFIELD, MASS.

ers' No. 1 Hohenburg, 2½ miles east of San Marcos, is standing at 2,141 feet in Trinity.

Jackson County

J. B. Douglas' No. 1 C. O. Lowrance, 12 miles northeast of Edna, has machinery on the ground for test.

Karnes County

Reynosa Oil Corp.'s No. 2 Butler, Block 43, located 1,000 feet south of No. 1, has resumed drilling at 1,947 feet to go to 3,000.

Kerr County

Walker-Van Duyn's No. 1 Barfield, B. B. Peck Survey, 4,700 feet to north line and 450 feet to east line, is drilling at 1,050 feet.

LaSalle County

E. V. Cheneweth's No. 1 Fee, Survey 58, located in the north central part of the lease, has been spudded in. Francis C. McCarty Organigation's No. 1 R. C. Sutton, Survey 36, located 250 feet to south line and 1,500 feet to west line, is rigging up. Sun Oil Co.'s No. 1 Washburn, Survey, 157, located 3,500 feet to north line and 3,500 feet to west line, is drilling at 3,755 feet.

Live Oak County

Delta Oil Co.'s No. 1 McNeil, Jane Curry Survey, is drilling at 1,409 feet with drill stem test at 1,152-62 feet showing water. Houston Oil Co.'s No. 2 Brown Land & Cattle Co. is drilling at 636 feet.

Medina County

Pat M. Armstrong's No. 1 Mangold, Survey 62, located 200 feet to south and east lines of farm, has completed derrick at 510 feet. F. Banderet's No. 1 Mofield, Survey 532, is location. Chacon Oil Co.'s No. 1 Jungman, Survey 31, located 950 feet to west line and 600 feet to south line, is showing little oil at 768 feet; No. 2 Jungman, Survey 31, located 1,500 feet to east line and 500 feet to south line, is at 1,400 feet.

Maverick County

Ryan Consolidated Petroleum Co.'s No. 1 Indio, Survey 14, center, is drilling at 3,415 feet. Rycade Oil Co.'s No. 1 Chittim, Section 129, Block 7, is at 4,285 feet waiting on water; No. 2 Chittim, Section 158, Block 7, is drilling at 2,820 feet.

San Patricio County

Ed R. Herwick's No. 1 Tsesmelis is drilling. Ed Leach's No. 2 Collins, Edwards McGloin Survey, SE, Section 39, and a few miles northwest of Mathis, is ready to spud in. National Oil Co.'s No. 1 Sullivan, J. C. McMullen Survey, 500 feet to SW cor., is blocking up derrick at 1,805 feet, putting on control head and big cement block around casing. Pargee Petroleum Co.'s No. 1 Beall is drilling at 810 feet. George B. Pickett's No. 1 Garnett is shut down at 3,030 feet; No. 1 Whitworth, NW NW Section 60, is drilling at 1,960 feet. John Sigmund's No. 9 Robinson is shut down at 2,245 feet due to inclement weather.

Uvalde County

Pure Oil Co.'s No. 1 J. D. Smythe, Survey 687, located 740 feet to north and 146 feet to east line of SE cor. of Section 20, is drilling at 1,530 feet.

Victoria County

J. J. Elam's No. 1 Vol Kutchka, located 200 feet to CNL of Section 40, is shut down at 200 feet after setting surface casing. Humble Oil & Refining Co.'s No. 1 Welder is drilling at 1,163 feet in gumbo.

Val Verde County

East Del Rio Oil Co.'s No. 1 Russell, Section 183, is shut down at 3,210 feet. Magnolia Petroleum Co.'s No. 1 Whitehead, Survey 81, is drilling at 5,650 feet. O. O. Owens and others' No. 1 Henry Mills Section 128, Block 1, is in sand at 4,150 feet and shut down. W. V. Traves' No. 1 Wilson, Section 115, is drilling at 791 feet.

Zavala County

J. G. Pundt's No. 1 West, Fuentes Survey, NW cor. and east of Uvalde on the Batesville road, at 1,312 feet drilled in, very little gas, but has since increased to about 100,000 feet with good rock pressure. Western Gas & Fuel Co.'s No. 1 West, in the northern part of the county, is drilling at 1,000 feet, topped basalt at 735 feet and went out of it at 884 feet.

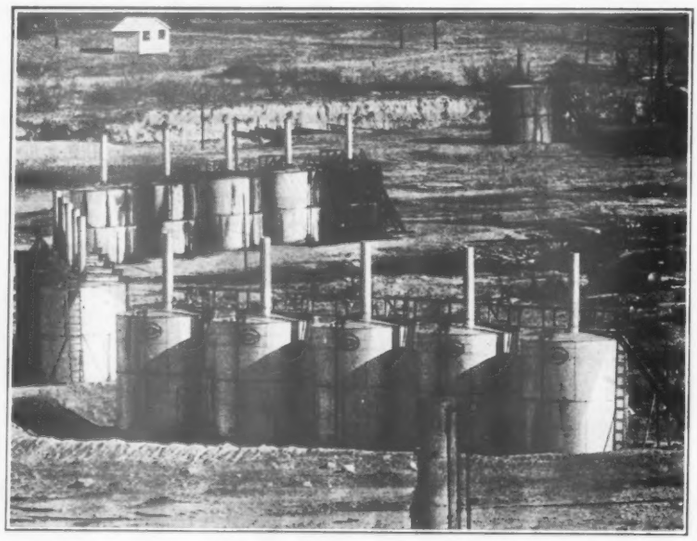
INGENIOUS METHOD FOR HANDLING OIL WITH HYDROGEN SULPHIDE

Hydrogen sulphide, that gas encountered in the West Texas oil fields which smells like rotten eggs and has proved destructive to men and material alike, calls upon the operators constantly for new and ingenious devices to combat its effects.

The United States Bureau of Mines states that hydrogen sulphide is intensely poisonous and quickly causes unconsciousness and death because of its paralytic action on nerve centers controlling respiration and the heart. Sayers, Mitchell and Vatt found that 600 parts per million (0.06) of H_2S in air renders a dog unconscious in about two minutes and kills it in about 15 minutes. Leinman determined that persons were affected slightly after several hours exposure to concentrations of 100 to 150 parts per million and that 1,000 to 2,400 parts per million are quickly fatal to men or animals. Its lack of odor in deadly concentrations makes hydrogen sulphide very treacherous. A number of men have lost their lives in the West Texas fields from inhaling it.

With this condition to contend with the Mid Kansas Oil & Gas Co. has developed a very ingenious and safe method of handling oil into the lease stocks tanks without danger to the men and the accompanying pictures show several batteries of Parkersburg Rig & Reel Co. 500 barrel bolted steel stock tanks equipped with these devices, which this company is also manufacturing for general distribution.

The two units of this protective device consist of the stack placed on top of the manhole dome of the tank which serves to carry the hydrogen sulphide gas quickly to the air well above the workman's head, and of a gauging well which is inserted into the tank in place of the usual cast iron thief hole cover. This is a tight galvanized iron pipe about 8 inches in diameter which extends nearly to the bottom of the tank and the gas within the tank is sealed off from this well by the oil around it.



Safety devices on West Texas tanks.

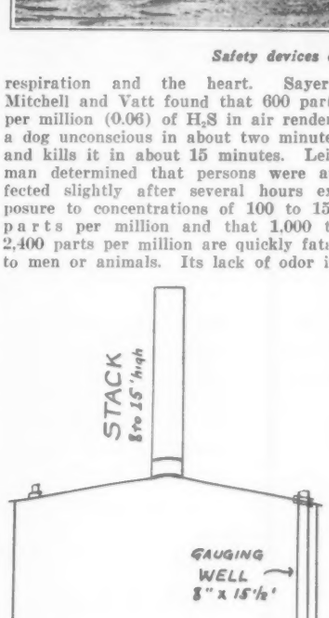


Diagram of protective device.

By the use of these two devices the gaugers can work freely on the top of the tank and when the big well making about 2,500 bbls. in 45 minutes was permitted to flow wide open for that time no inconvenience was experienced by the watchers on top of these flow tanks, and it was possible to observe the oil rising in the gauging well, and by this means gauge the depth of oil in the tank without discomfort or danger. Without these devices it is doubtful if these tanks could have been successfully filled from this huge well without overflowing.

BETTER FEELING IN OKLAHOMA MARKET

(Continued from Page 30)

customers. Standard quality served as a means of holding this business even at fairly high prices. Refiners who are consistently selling a low-flash kerosene having good burning qualities have no trouble in getting a small premium for their product.

Furnace oil sales slowed up somewhat as a result of having passed the greatly increased business immediately following the holiday lull, but this business still continued to represent a good share of the total shipments from some refineries. We have already passed the peak seasonal demand for this product and refiners will probably gradually decrease their production, throwing a greater amount of their normal production into kerosene. This fact will tend to hold kerosene prices at their present level for at least two months when the spring demand of the agricultural areas comes.

Gas oil displayed more firmness and reflected the better feeling regarding the future of gasoline prices. Furthermore, refiners who had been carrying large stocks have either reduced them to an operating margin or have withdrawn from the open market. A similar strengthening of the fuel oil market could be seen in so far as considerable quantities of the low gravity fuel was sold at 75 cents whereas practically all spot fuel of the same classification was sold at 70 cents last week. Sales managers are generally pessimistic about the general fuel market over the immediate future and prices will probably not advance materially until crude prices are advanced and then their advance may lag. An aid to refiners in the fuel market has been effected through many plants converting their stills and boilers to burn oil instead of gas. Plants already equipped to burn either find it advantageous to burn oil at its present price instead of gas and in addition reduces the amount of products to be moved.

Lubricating oils have shown no change in price but their movement continues slow. Cylinder stocks were freely offered, hopes being placed in the export market. Bright stocks reflected the same weakness but there was no tendency to lower prices any further than their present low level. Wax inquiries, together with the improved eastern market allowed refiners to advance their quotations and while shipments were being made at the low of last week, refiners were hopeful of increasing their prices immediately.

Gasolines and Naphthas

While the U. S. Motor grade gasoline sold all the way from 5½ to 6 cents, the general low price, direct to the trade, was 5⅝ cents. Likewise, the 6-cent business was practically restricted to the local trade and shipments made out of the State at this price usually went to customers of long standing. The 60-62 390 and 400 endpoint grades were freely offered at last week's low and in some cases were offered fractionally under this. Naphtha shipments increased slightly. There are so few refiners making it and the shipments are usually made locally so its price has been maintained at a fairly high level compared with gasoline.

Natural Gasolines

Material strength was apparent in the A and AA grades of natural gasoline and prices were advanced with the probability that quotations will be made at still higher figures over the next few days. The export shipments to the Gulf Coast have removed all of the storage oil except that held by the larger companies who are not willing to sell. The continued buying of these grades coupled with their low production resulting from the cold weather promises to afford sufficient strength to maintain higher prices. The B and BB grades did not show this strength and were slightly lower in price due to the slow domestic demand on the part of refiners. Some of the larger manufacturers have entered the spot market and are purchasing the cheaper grades on the open market and these may be expected to strengthen over next week.

Kerosene and Distillates

Trading on these markets was restricted to the normal, low seasonal demand and there was little thought of increased prices unless export purchases developed. The 41-43 grade generally sold for 4¼ cents with some material going fractionally lower. The low flash, good burning test kerosene generally brought 4⅜ cents.

Gas Oil and Fuel Oils

Refiners received a greater number of inquiries for both gas oil and fuel oil and were not so pessimistic about their future. With gas oil stocks in a better position and the possibility of an improvement in gasoline prices, refiners raised their gas oil quotations an eighth of a cent making the new low 2⅜ cents. The low cold test material brought as high as 2⅞ cents. Much of the fuel which would have sold for 70 cents last week brought 75 cents this week and although it was still available at last week's low, there was no tendency to shade that price as was done in a few cases then.

Lubricants and Wax

Except for the further weakening of cylinder stocks, the lub market was unchanged. Wax quotations were generally an eighth of a cent higher but business was being done at 2⅝ cents, the low of last week. Some refiners advanced their quotations and expected to push the

price to 2¾ cents within the next week, depending on the reaction of the market toward the increase in the eastern market prices.

HENDRICKS POOL MAY COVER 17,000 ACRES

(Continued from Page 33)

ties; on pipe lines now building; and on lines it is felt may be constructed early this year.

Pipe lines now running oil from West Texas fields include the Humble's line to Ingleside with a capacity of 50,000 bbls. daily; its line to Comyn with a capacity of 40,000 bbls. daily; the Gulf's line to Ranger with a capacity of 25,000 bbls.; the Magnolia's 25,000-bbl. line to DeLeon; and the line of the Illinois Pipe Line Co. to Del Rio which is carrying 13,000 bbls. daily, making a total of 153,000 bbls. daily being carried by trunk pipe lines.

The Orient Railroad has loading racks handling 80,000 bbls. daily and an estimated daily maximum for 120,000 bbls. a day. The Texas & Pacific Railroad has loading racks handling 36,000 bbls. daily and a daily maximum capacity for 50,000 bbls., a total being handled by the railroads of 116,000 bbls. daily now and a maximum daily capacity of 170,000 bbls.

Refineries at McCamey and other points in the area including San Angelo and El Paso are using 20,000 bbls. daily of West Texas crude, 4,000 bbls. of which is transported through outlets mentioned while 16,000 bbls. daily is procured by other gathering lines.

Hence, present outlets for West Texas are trunk pipe lines handling 153,000 bbls. daily, railroads handling 116,000 bbls. daily and refineries using 16,000 bbls. daily above what is received through trunk lines and railroads, a total of 285,000 bbls. a day.

Prospective Outlets

Two companies are building lines to West Texas, the Shell constructing a 10-inch line to Healdton, Okla., which will have a capacity of 40,000 bbls. daily and the Illinois increasing its facilities with a line to Houston which will care for 22,000 bbls. daily in addition to the 13,000 bbls. now being taken to Del Rio.

It is said the Sinclair Pipe Line Co. is considering building a line to Mexia which would have a capacity of 40,000 bbls. daily and The Texas Company may construct a line to Port Arthur with a capacity of 40,000 bbls. daily. These lines would add 80,000 bbls. a day to facilities.

In addition, men in close touch with conditions in West Texas believe the Prairie Pipe Line Co. will find it advisable to construct a 10-inch line to Crossett, with a capacity of 40,000 bbls. daily and that the Gulf may decide to build a 12-inch line to Corpus Christi, adding 60,000 bbls. daily to its capacity. Railroads serving that territory — the Orient and Texas & Pacific are estimated to have a total loading rack capacity of 170,000 bbls. daily, an increase of 54,000 bbls. daily over present facilities.

Summing up the outlet facilities of West Texas — actual, building, probable and prospective—we have:

	Actual	Building	Probable	Prospective
Trunk p.l.	153,000	62,000	80,000	100,000
Railroads	116,000	.....	54,000	.....
Refineries	16,000	.....	.....	.....
Total	285,000	62,000	134,000	100,000

Estimated Outlet by July 1, 1928

Present actual	285,000
Present building	62,000
Probable new lines	80,000
Probable increase in R.R. outlets	54,000
Total	*481,000

*Barrels daily.

NEW TEAPOT INQUIRY

WASHINGTON, D. C., Jan. 14. — A new senate inquiry into a phase of the Teapot Dome naval oil reserve lease has been ordered. Without discussion, the Senate approved a resolution of Senator Norris, Republican, Nebraska, directing the Senate public lands committee to investigate the extinct Continental Trading Co., Ltd., of Canada.

CANADIAN FIELDS

(Continued from Page 55)

of 656 bbls. a day. The increase is partly accounted for by the exceptionally cold weather in December, the coldest since the well was brought in in October, 1924; the crude naphtha production always reaching its peak in cold weather. The total production from Royalite No. 4 in 1927 was 218,848.4 bbls., compared with 205,000 bbls. in 1926 and 168,722 bbls. in 1925. The monthly production figures for No. 4 during 1927 are: January, 18,846; February, 17,829; March, 19,868; April, 18,668; May, 18,693; June, 18,631; July, 17,141; August, 16,957; September, 16,487; October, 17,347; November, 18,043.4; December, 20,338. The 1927 output of Royalite No. 4 exceeded the 1926 output of all the Alberta wells, which was 217,000 bbls.

Royalite Wells

Production of Royalite Oil Co.'s No. 7, LSD 3, Section 13-20-3w5, offsetting Illinois-Alberta No. 1, amounted, for December, to 2,811.8 bbls., a daily average of 90.7 bbls. These figures are from actual deliveries to the pipe line. Illinois-Alberta Oils No. 1, LSD 14, Section 12-20-3w5, to which Royalite No. 7 is an offset, produced in December 2,993.2 bbls., averaging 96.55 bbls. a day. Vulcan Oils No. 1, LSD 11, Section 13-20-3w5, produced 1,783.6 bbls., averaging 57.53 bbls.; this well was, however, frozen part of the month. McLeod Oil Co.'s No. 2, LSD 16, Section 1-20-3w5, made 1,219.9 bbls., a daily average of 39.35 bbls. Total crude naphtha deliveries for December amounted to 29,145.7 bbls., compared with 23,586 bbls. in November. The Royalite Oil Co. takes this production from the independent producers on a basis of $3.95 per barrel, making the value of the entire December production $155,122.75.

Royalite Oil Co.'s No. 6, LSD 16, Section 31-10-2w5, is at 3,685 feet and reaming the core hole. Royalite's No. 8, LSD 9, Section 12-20-3w5, has just finished fitting up, preparatory to resuming drilling at 2,636 feet. Royalite's No. 9, LSD 6, Section 13-20-3w5, is at 2,724 feet and drilling. Royalite's No. 10, NE Section 12-20-3w5, is at 2,231 feet and running 10-inch casing.

Dalhousie Oil Co.'s No. 1, LSD 4, Section 18-20-2w5, has cemented casing in the top of the Madison limestone at 4,413 feet and is waiting for the cement to set. Dalhousie Oil Co.'s No. 5, LSD 16, Section 30-19-2w5, is at 4,830 feet and drilling. Dalhousie's No. 6, LSD 10, Section 13-20-3w5, is connecting boilers preparatory to resuming drilling at 4,517 feet. Home Oil Co.'s No. 2, LSD 14, Section 20-19-2w5, is at 3,175 feet and running 8¼-inch casing. In the north end of the Turner Valley, Foothills Oil & Gas Co.'s No. 1, SW Section 26-20-3w5, is at 3,498 feet and underreaming at 1,268 feet.

Illinois-Alberta Oils' No. 1, LSD 14, Section 12-20-3w5, production report for the week ending December 31 showed 751.6 bbls. of crude naphtha, averaging 107.4 bbls. a day. Illinois-Alberta's No. 2, same LSD, is drilling in a very hard formation at 1,241 feet. New McDougall-Segur's No. 1, LSD 14, Section 12-20-3w5, is again on the pump after several days' delay making repairs.

Making New Hole

Spooner Oils' No. 1, LSD 12, Section 13-20-3w5, is making new hole at 4,890 feet after drilling up a bailer which was lost and frozen in the hole by a wet gas flow. This test is thought to be close to the big wet gas sand in the Madison. Vulcan Oils' No. 2, LSD 11, Section 13-20-3w5, is drilling in a very hard stratum in the Fernie shale horizon at 4,210 feet.

Stockmen Oils' No. 1, LSD 1-2, Section 27-20-3w5, is hauling timbers for a temporary derrick to finish its deep test in the gas horizon at 1,760 feet. Actual work will not likely be resumed till February, as the drillers injured in the explosion which wrecked the well are still under medical care.

Calmont Oils' No. 1, LSD 2, Section 1-20-3w5, is drilling below 4,715 feet, after a short delay to put on a new

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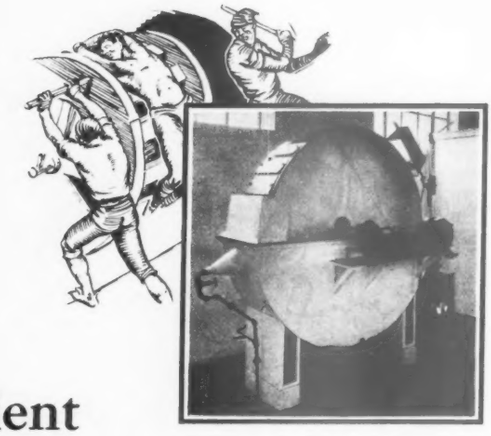

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brakeband. A white, sandy stratum, one of the markers in the Kootenay formation, was met between 4,700 and 4,715 feet, indicating that the Kootenay, like the Blairmore-Dakota, may be thinner at this point than further east and north in the field, which would point to a possibility of a rise in the underlying formations. The test will be drilled into the dolomite, which may be got 600 feet below the present drilling depth.

Seneca Oils, LSD 1, Section 34-20-3w5, is at 3,710 feet and held up by casing trouble. About 20 feet of casing at 3,300 feet depth became frozen through a caving, and the casing below, resting on the bottom of the hole, became disconnected. The casing will be pulled and run again.

Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, has a fishing job with an underreaming tool and a lot of cable in the hole. The fall of the tool jarred and broke the bull wheel, a flying portion mashing the top of the derrick. The damage has been repaired and a new bull wheel installed for the fishing job. The test is at 4,400 feet depth.

The extreme cold weather of December resulted in a heavy pull on gas reserves of the Canadian Western Natural Gas Co., the consumption in Calgary alone, mostly from the Turner Valley Field, reaching on some days a peak of 37,000,000 feet.

New Railroad

A railroad project to serve the Turner Valley Field is foreshadowed by application at Ottawa for incorporation of the Highwood Western Railroad. The proposed line will run from either High River or Okotoks through the Turner Valley Field into the Highwood Valley to the source of the Highwood River, thence west to Elk River, British Columbia, connecting near Sparwood with the C. P. R. line in the Crow's Nest Pass. The charter applicants are H. A. Ford, W. Robertson, G. H. Webster, F. R. Webster, J. A. Hunter, R. J. McLaren, J. C. McNabb of Calgary. Charters have already been granted for the Calgary & Fernie and Calgary & Southwestern lines to serve the same territory; the former line is applying for a time extension.

In the Highwood district, Imperial Oil, Ltd.'s, Highwood No. 1, LSD 3, Section 36-18-3w5, is at 3,624 feet and straightening a crooked hole.

In the Moose Mountain district, Signal Hill Oil Co.'s No. 2, LSD 9, Section 34-23-5w5, has resumed drilling at 1,677 feet, after the holiday shutdown. Following a bad caving, the 10-inch casing was lowered to 1,600 feet, and will be carried further as may become necessary. Arrangements have been made to drill through the winter.

The Mutual Oil Co., which has an unfinished test in LSD 11, Section 14-47-27w4, held its annnal meeting at Vancover, British Columbia, recently. The following directorate was re-elected: President, A. Scobie, Victoria, British Columbia; general manager, F. L. Runions, Vancouver, British Columbia; directors, G. J. Bagshaw, Victoria; Capt. W. B. Laycock, R. S. Anderson, E. T. McGregor, Vancouver; secretary-treasurer, A. E. Robertson. In addition to its acreage in east central Alberta, near Pigeon Lake and in the Wainwright Field, the company has secured leases in the Jumping Pound and Turner Valley Fields. No early development work is contemplated.

Ribstone-Blackfoot

On the Ribstone-Blackfoot structure, east of the Irma-Wainwright Field, Ribstone Oils, LSD 1, Section 1-46-1w4, has recovered the lost drill stem and is cementing casing at 1,925 feet to shut off water. To fish out the lost tools it was necessary to run a string of 6-inch, and for the cementing job, 2,000 feet of 2½-inch tubing has been sent to the field and up to 1,000 pounds pressure will be used if necessary. Following the abandonment of Imperial Oil, Ltd., Ribstone's No. 1, Section 5-45-1w4, after drilling to 3,489 feet, the outcome of the Ribstone Oils' No. 1 is being awaited with interest. At the present depth, 1,925 feet, the Ribstone Oils' No. 1 is close to the horizon in which the Imperial-Ribstone got a show of oil, and being more favorably located on the structure it may secure commercial production.

For the year 1928 extensive development operations are planned by the Alberta subsidiaries of the International Utilities Corp. In the Viking gas field, the Northwestern Utilities, Ltd., which supplies gas to Edmonton, will drill two tests to the Viking sand, to maintain its gas supply. In southern Alberta the Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary is planning to drill four tests for gas in the Barnwell and Foremost Fields, though the allocation of these tests as between the two fields has not yet been settled. Core-drilling is now being done near Barnwell, and three or four other locations will be core drilled in the present year. All this work is primarily intended to maintain the gas reserves of the Northwestern Utilities, Ltd., and the Canadian Western Co.

A new natural gas enterprise is mooted for the development of a gas supply for the Saskatchewan cities of Saskatoon, Regina and Moose Jaw. In 1927, S. E. Slipper, geologist for the Canadian Western Co., conducted extensive surveys in Saskatchewan with a view to locating new gas fields, and as a result of core drilling located a promising structure about 40 miles south of Saskatoon. This structure will be commercially tested in the spring of 1928, a core drill capable of going down 2,200 feet being used.

Marland Deep Tests

Tentative agreements have been negotiated by the Canadian Western Co. and allied interests for deep tests by Denver interests and by the Hudson's Bay-Marland Oil Co. on structures in which the Canadian Western Co. is interested, drilling to commence before July 15, 1928.

In the border fields, Gas Production & Transportation's No. 1, NE Section 21-4-18w4, near Warner, is reported drilling in a blue shale at 2,305 feet and carrying 10-inch casing.

In the Skiff Field, Devenish Petroleum's No. 1, LSD 5, Section 27-5-14w4, is hauling pipe preparatory to rigging up the pumping outfit.

In the Cypress Hills district, southeastern Alberta, Eagle Butte Oil Co.'s No. 1, LSD 3, Section 31-7-4w4, is shut down at 1,000 feet.

In the Waterton Lakes district, Alberta Oil & Gas Co.'s No. 1, near Hillspring has a steel derrick up, and is hauling equipment to location. The test is expected to spud in about January 20. The company is a Henry L. Doherty subsidiary.

On the Montana side, the Mill City Oils, Ltd.,'s No. 1, SW Section 29-35-3w, has spudded in. The location is in the west pool of the Kevin-Sunburst Field, and production is looked for between 1,600 and 1,700 feet. The company is financed largely by Calgary men.

Ontario Fields

In the Ontario fields, Ajax Oil & Gas Co.'s No. 1, Reaume farm, Dover West Township, Kent County, has finished a deep test of the Trenton limestone, offsetting the Union Natural Gas Co.'s No. 1 discovery well in this field. The test got production at 3,065 feet, starting with an estimated production of 500,000 feet. A shot was put in after which actual measurement showed a production around 300,000 feet a day. The test was drilled in 45 days, the work being handled by Frank H. and Clair Stover of Chatham, location having been made by E. P. Rowe, geologist for the Ajax company. A larger production was generally anticipated, as the Ajax's No. 1 was only 350 feet from the Union Natural Gas Co.'s No. 1 discovery well which in 1927 opened the Dover deep field with an initial production of 6,500,000 feet a day and which is still making some gas. The Ajax Oil & Gas Co. recently secured some 314 acres in the Dover Field, including some acreage that had been surrendered by the Union Natural Gas Co. It is reported that the Ajax company is negotiating for the sale of its gas production to the Union company, whose lines are close to No. 1 well, and that Ajax No. 2 is being located about 600 feet from No. 1.

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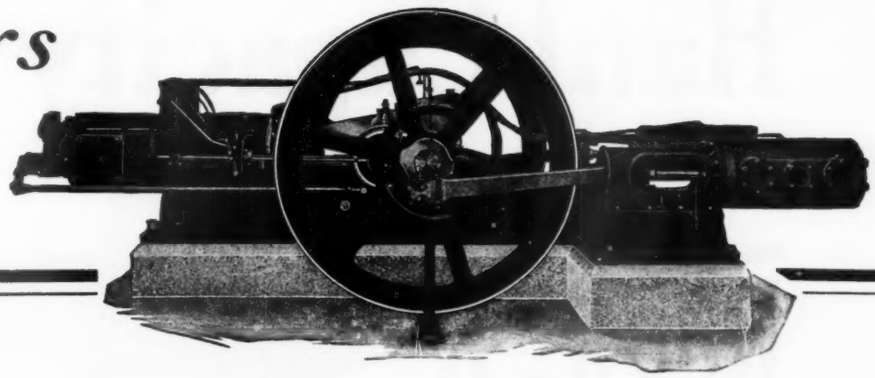

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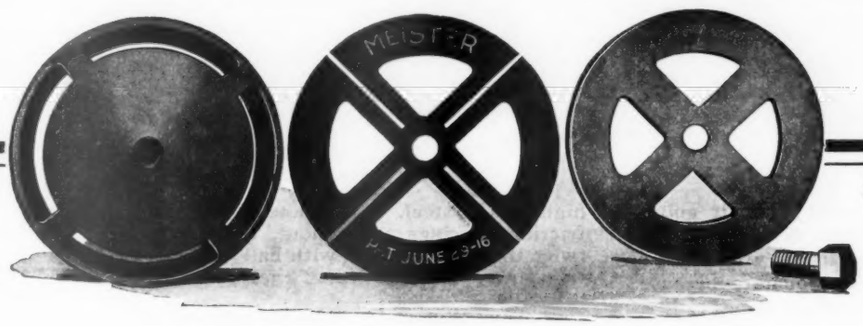

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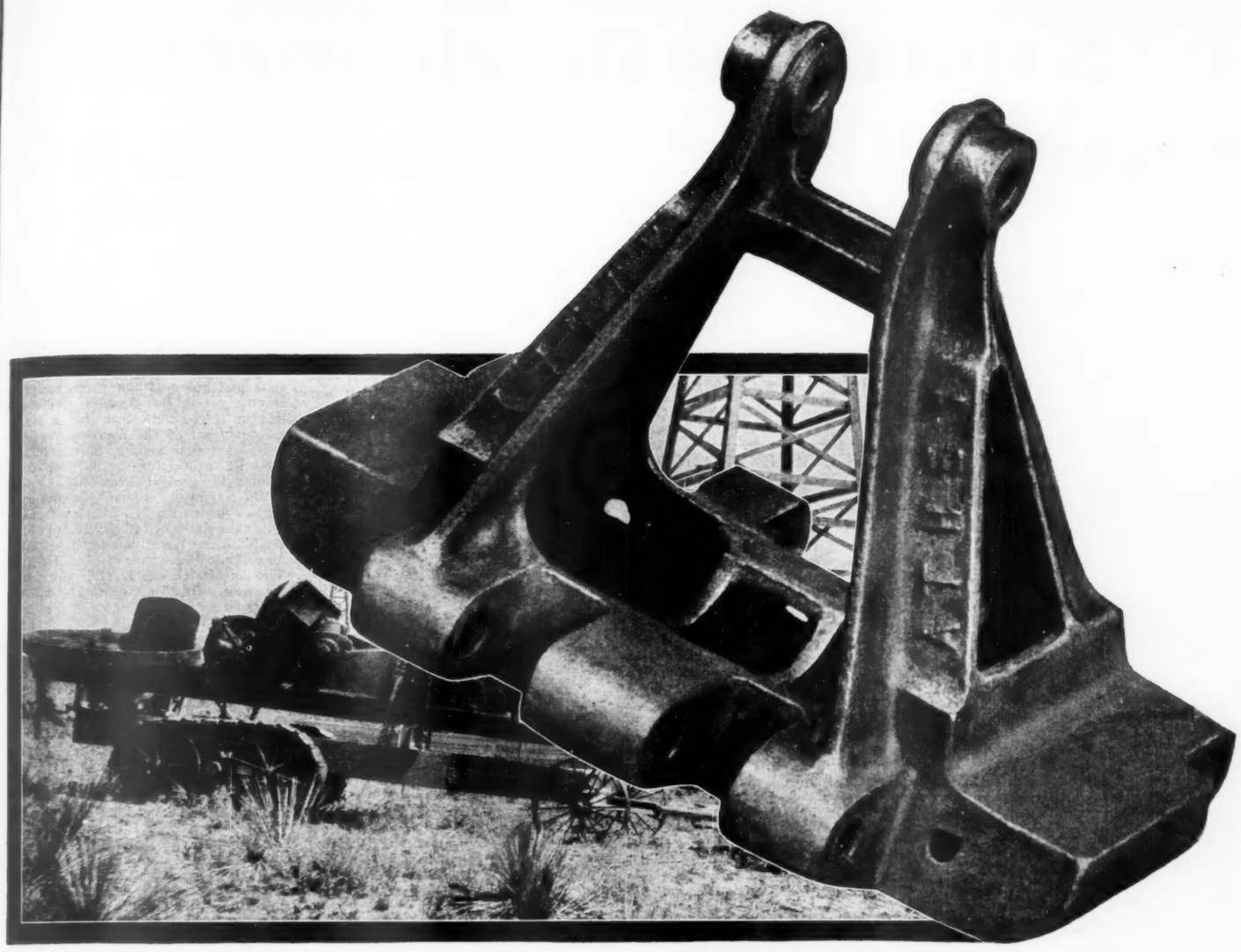

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SIVYER STEEL CASTING COMPANY, MILWAUKEE

Natural Gas Developments

GAS PRESSURE NORMAL DURING HOUSTON PEAK

During the recent cold wave at Houston, Tex., men were stationed at each of the high pressure lines serving systems of laterals to homes in all sections of the city to regulate the flow of gas and the pressure was kept well above the normal requirement at all times, H. E. Danner of the Houston Gas & Fuel Co. said.

Trouble resulted not from low gas pressure but from inferior house piping and defective heating appliances, Mr. Danner declared. There has also been some trouble with the freezing of oil on the leather diaphragms which regulate the gas supply in individual meters. These complaints were particularly numerous in Magnolia Park, where the majority of meters were placed in the backyards, exposed to the cold.

"On Christmas Day—when everybody was at home and home consumption of gas was at a maximum—we received only three complaints," Mr. Danner said. "The trouble in all three cases was defective burners. We consider this a record not only for Houston but for distribution in any city of the country during a cold wave."

The amount of gas consumed in Houston that day exceeded 31,000,000 cubic feet, a new high record. The following day the total was even higher. The previous high was approximately 27,000,000 cubic feet during the cold wave on December 16.

If anyone did not get sufficient gas pressure during the cold days it was because of some local condition at the home and not because of a general condition, D. H. Tucker, assistant public service commissioner, said. Mr. Tucker talked with officials of the Houston Gas & Fuel Co. relative to complaints received from practically every section of the city. The reply was that clock charts showed no low pressures anywhere in the city system.

Charts showed that when the days were coldest, an average of 5 ounces of gas was in the line at all hours. Four ounces is the regular pressure and a burner will ignite at 1 ounce pressure.

Complaints that gas was of low pressure met with the reply that it could not be because of general low pressure but was due to local conditions at the home. Many homes, Mr. Tucker said, are piped with half-inch lines instead of 1-inch lines and any drain on the system is quickly noted in other burners.

When artificial gas was used it was used principally for cooking purposes, gas officials explained. But the cheapness of natural gas permits using it for general heating purposes with the result that the small pipes can not carry the extra demand for gas.

TEXAS TO SUPPLY GAS TO MATAMOROS, MEXICO

SAN ANTONIO, Tex., Jan. 14.—Gov. Portes Gil of Tamaulipas, Mexico, has signed a concession for natural gas to be supplied to Matamoros, Mexico, and arrangements have been made to take gas from the Rio Grande Valley Gas Co. at the International bridge in Brownsville, the gas coming from the Mirando Field in Webb and Zapata Counties. A company with a capitalization of $50,000 has been formed and a permit is being sought from the United States Government. Jose Martinez of Brownsville and Eufrasio Perez, Emiliano Fernandez and J. Montmayer of Matamoros compose the company. A distribution system will be put in at Matamoros and gas from the American side will be taken through a 6-inch line.

OKLAHOMA GAS FRANCHISES

OKLAHOMA CITY, Jan. 14.—Several Oklahoma towns are scheduled to vote on natural gas franchises. Carnegie, Caddo County, will vote January 24 on granting a franchise to George H. Lowerre, Jr., the distribution system to be installed not later than June 30, 1928. Kingfisher city commissioners have approved the calling of a gas franchise election to be held probably February 7. A. C. Black of Fort Smith, Ark., and O. F. Gould of Tulsa, the applicants, are also planning a gas line to Dover and Hennessey if franchises can be secured. The town board of Gage has adopted an ordinance granting a gas franchise to the Winchester Oil & Gas Co., subject to a special election.

PITTSBURGH EXPLOSION LOSS OVERESTIMATED

PITTSBURGH, Pa., Jan. 14.—Total damages resulting from the explosion of a gas holder of Equitable Gas Co. on November 14 will be less than estimates made by company engineers shortly after the accident. The original estimate showed a total loss to persons and property of from $3,000,000 to $5,000,000. It is still too early to compute accurately the loss to the company, but restoration work already completed has cost less than was expected.

Damages to residences are being repaired by company employes and contractors hired by the company at a substantial saving over the probable cost of cash settlements. Nearly 300 houses have been restored and about 500 personal injury cases handled. About two-thirds of the claims of individuals have been settled.

The policy has been to settle claims of individuals as promptly as possible, but settlement of damages to industrial plants of corporations will await a decision on a test case which will determine the responsibility. A coroner's jury has declared the explosion purely accidental, which is distinctly in the company's favor. The test case will determine whether the company or the contractor repairing the tank, or both, were responsible. In case the courts should rule the contractor shared in responsibility, the gas company will make efforts to secure a refund from the contractor covering a share of the expenditures already made in settling individual cases.

The Philadelphia Co., which owns all securities of the Equitable Gas Co., will lend financial assistance to the subsidiary to take care of all claims.

GAS FOR IMPERIAL VALLEY

EL CENTRO, Calif., Jan. 14.—Declaring that the demand here for domestic gas is so great as to require additional manufacturing facilities, the Inland Empire Gas Co. announced that it would spend $40,000 erecting an additional plant immediately. H. W. Burkhart, president, stated that the machinery for the new unit has been purchased.

The Inland company completed its mains and began delivering gas to consumers here within the past year. Its plans call for the extension of pipe lines to serve Brawley, Calexico, Mexicali and other valley towns in the future. A franchise covering the entire Imperial Valley has been secured.

NEW KANSAS GAS LINE

SALINA, Kans., Jan. 14.—Announcement has been made by the Kansas Pipe Line Co., owned by the North American and Studebaker interests, that an 8-inch gas line will be built from Hutchinson to the McPherson gas field. The territory now served from McPherson will be connected with the Oklahoma and Texas fields.

EXTENSION OF TIME ON K. C. FRANCHISE

KANSAS CITY, Mo., Jan. 14.—Almost 200 patrons signed by the Industrial Gas Co. in 56 industrial classifications were reported by John L. Knorpp, president, in applying for a 90-day extension for accepting the franchise granted August 1. The time allowance originally granted by the council is to expire January 27.

"We are doing everything possible," said Mr. Knorpp, "to get in shape to accept this franchise by January 27, but are asking this extension so that our rights will not be jeopardized if the company cannot accept within that time."

In the 90 days the company representatives have been seeking prospective patrons, Mr. Knorpp reports, contracts for the sale of approximately 50,000,000 feet of gas a day have been closed. The peak supply from the Amarillo Field under lease by the Kansas City-Texas Gas Co., the parent of the Industrial company, is 119,931,900 feet, it has been announced. The contracts include some industries in cities between here and Amarillo.

"The necessary steps in financing have been concluded," said Mr. Knorpp, "but bonds must be prepared and approved and many details handled."

Members of the two eastern banking firms financing the new natural gas enterprise were included in the board of directors announced by Mr. Knorpp: Alfred C. Dent, vice president of Peabody, Smith & Co., New York; Stanton Griffis, partner of Hemphill, Noyes & Co., New York; Robert B. Caldwell, Kansas City; R. M. Cook, Kansas City; B. L. Hupp, president Loose-Wiles Biscuit Co., Kansas City; J. A. Wigmore, Cleveland; R. J. Windrow, Dallas, vice president of Smith Brothers, builders of the new Kansas City waterworks; George F. Coomber, Kansas City, president Coomber Realty & Investment Co.; Sam B. Strother, Kansas City lawyer. A city director is to be named by the council.

COMPLETION OF SURVEY FOR COLEMAN GAS LINES

COLEMAN, Tex., Jan. 14—Probable completion of the first half of the Lone Star Gas Co.'s 10-inch line from gassers in Coleman County to Brownwood and the completion of surveys for additional network of connecting lines between gassers in the north part of the county supplying the Western Gas Service Corp. gave a further assurance that gas from this county will find a ready market with the two companies.

The entire length of the new line from Overall and Sealy Smith gassers south and west of here to Brownwood, will be 35 miles, of which the first 16 miles have been completed and buried in the 28-inch ditch. Six miles of the Lone Star's line connecting the Continental Oil Co.'s M. G. Cheney No. 2-B Overall with the Roth & Faurot Nos. 1 and 2 Sealy Smith is reduced to 8-inch, carrying a lesser load than the main into Brownwood's distributing system.

In the northern section of the county, Western Gas Service Co. plans to lay a series of connection lines from the Canary No. 1 Morris to other gassers on the Moore tract in the A. Arew Survey to furnish an additional supply for Rowena, Ballinger, San Angelo and Winters, J. P. Caldwell, county engineer, has completed the survey for the proposed lines and construction will start within a week.

The Lone Star will continue the 18 miles of its 10-inch line into Brownwood under the direction of Tom Waddell, working from Santa Anna into Brownwood. Thirty or 40 days will likely be required to complete the entire line after ditchers and other equipment are transferred from Coleman.

GAS RATE HEARINGS ON IN LOS ANGELES

LOS ANGELES, Calif., Jan. 14.—An immediate 5-cent interim reduction in gas rates in Los Angeles, pending outcome of further investigation, was asked by City Attorney Stephens at a hearing before the State Railroad Commission, which was called on the commission's own motion to inquire into the rates, tolls and rules of the three companies serving gas in Los Angeles, was continued until the 20th inst. for a further consideration of the decrease requested. After that date another adjourned hearing will be held for the purpose of continuing the general investigation.

The city attorney based his plea on reports submitted by H. M. Kauffman, assistant engineer of the city Board of Public Utilities. Kauffman testified that on an estimated rate base of $56,679,436, the Los Angeles Gas & Electric Corp. earns a revenue of 8.25 per cent. He estimated the average rate base for the company will be $59,227,108 in 1928. On this amount, the witness testified, the company will have a revenue of 10.4 per cent, or approximately $1,500,000 in excess of the usual fair return of 8 per cent allowed by the Railroad Commission.

Kauffman also declared the average heat value of the natural gas served by the corporation during the last 11 months was 1,093 per 1,000 cubic feet.

Stephens stressed this point in his argument for an immediate and temporary reduction pending a further investigation. According to Stephens' argument, when the Railroad Commission fixed the present rates for natural gas in 1926 it contemplated the service of gas having 1,147 heat units. He declared this being the case, it is unfair for the consumers to be required to pay the present rates when they receive gas of the lower heating value.

In refuting this argument, Paul Overton, attorney for the gas company, said the city's engineer made several errors and as a matter of fact, there is not as much discrepancy between the present rates and the value received by the consumers as the city indicated. At the next hearing, he said, he would produce sufficient evidence to show his statement is correct.

GAS FOR ST. JOSEPH

ST. JOSEPH, Mo., Jan. 14. — The Cities Service Co. announces that pipe has been ordered for natural gas mains from Leavenworth, Kans., to St. Joseph to supply natural gas to this city. The cost of the installation will be $1,000,000, it was said.

The pipe line will cross the Missouri River at Leavenworth, the piping to be attached to the government bridge.

NEW ANTISEPTIC FROM GAS

The gas industry is responsible for the development of a new antiseptic of exceptional properties, according to a recent announcement of the American Gas Association. This new product, a derivative of coal tar, was discovered in the laboratories of the South Straffordshire Mond Gas Co., England. The English informant of the American Gas Association reports that the experience of a great number of medical men shows that this new antiseptic is far superior to any other product now in use. It is almost nonpoisonous, and is nonirritant to even the most delicate membrane. Antiseptics are but one of the many derivatives of coal tar, which is made in the manufacture of city gas.

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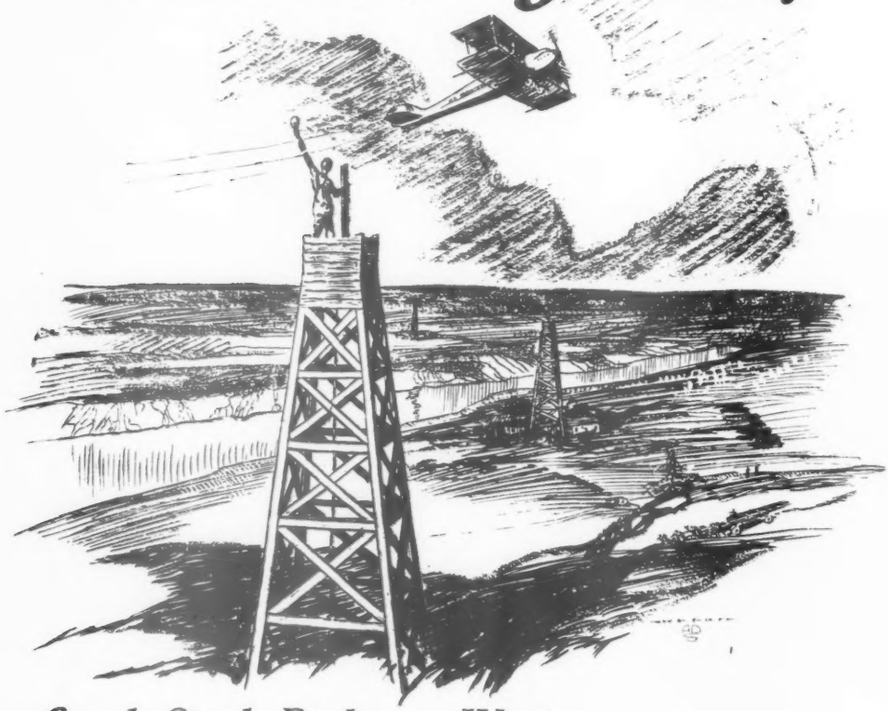

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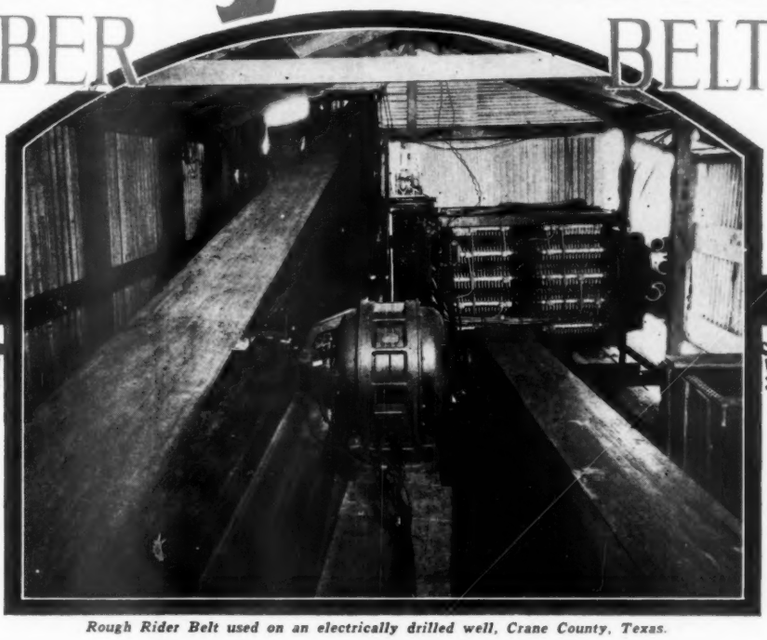
Rough Rider
RUBBER BELTING



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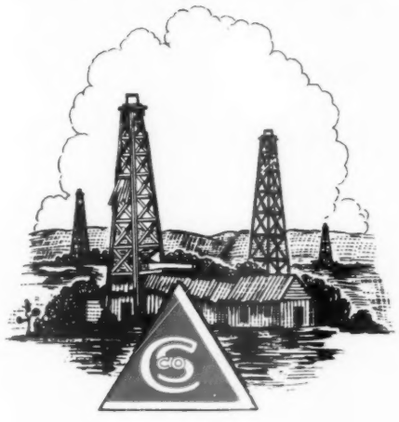

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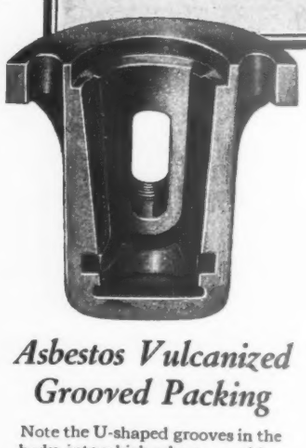

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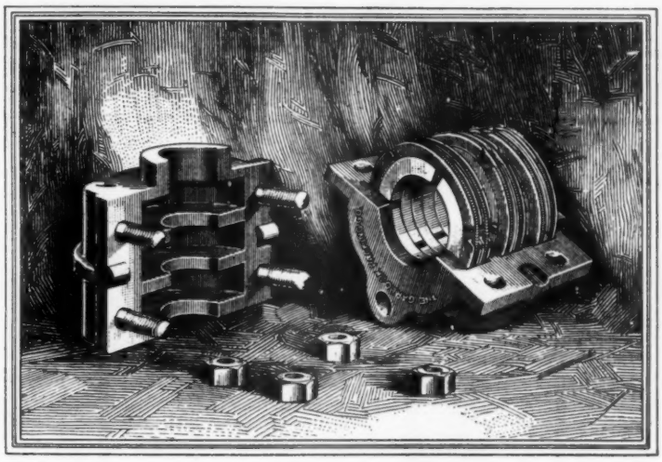

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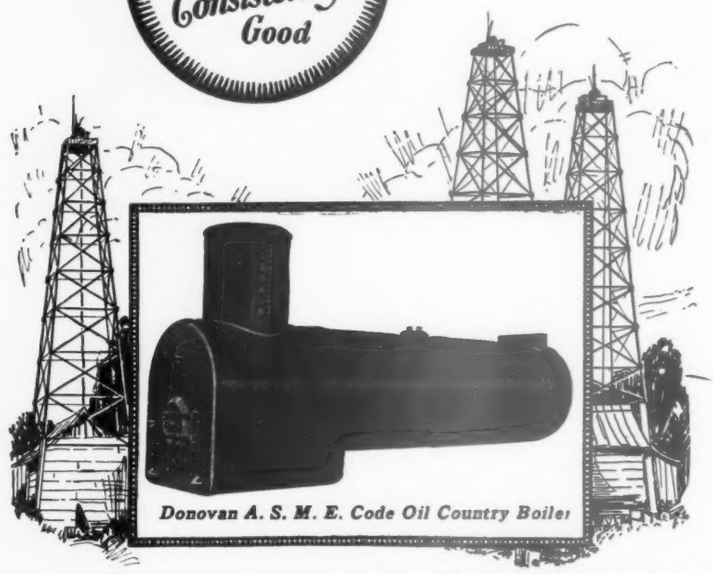

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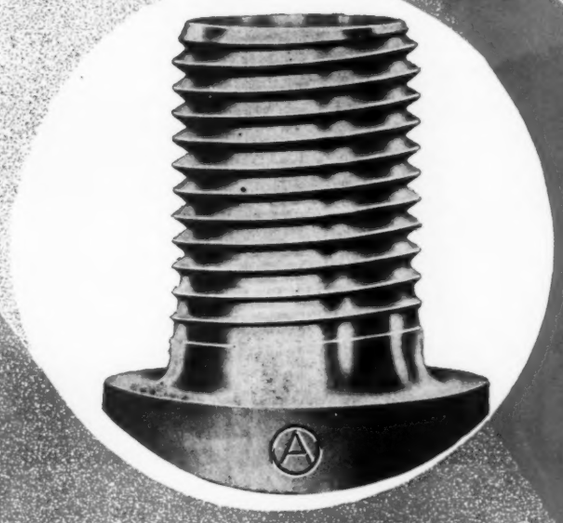

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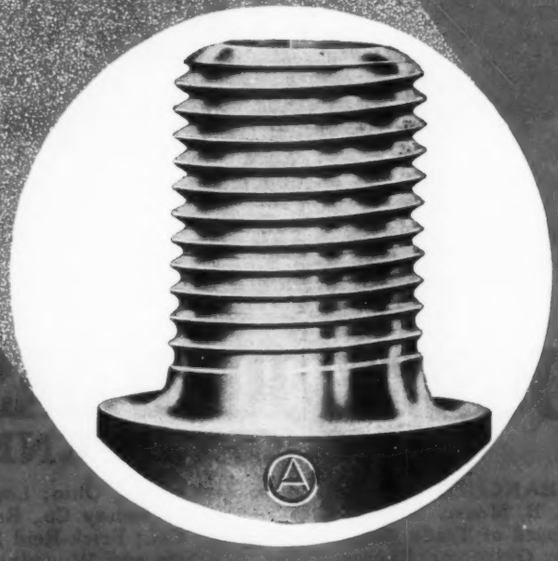

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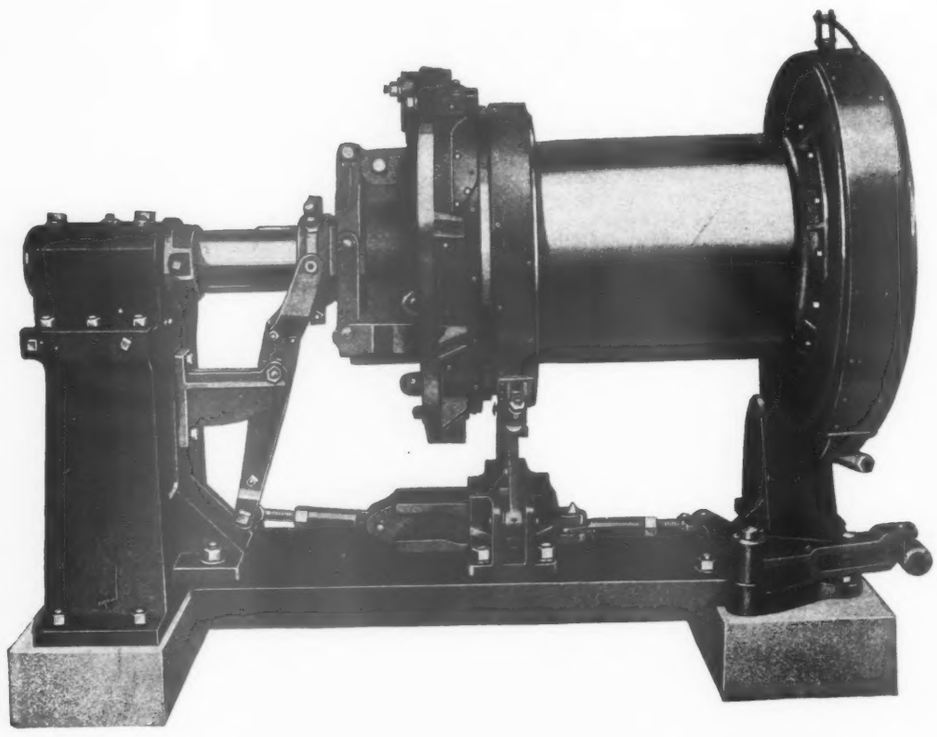

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Mast 8x10x36 ft., Douglass Fir A-Style Two Wheel Truck, two 16" Bronze bearing crown pulleys, 2½ Steel Pin mounted in malleable boxings. Large supporting plate 16" dia. between crown pulleys, eliminating any chance of bending pin.

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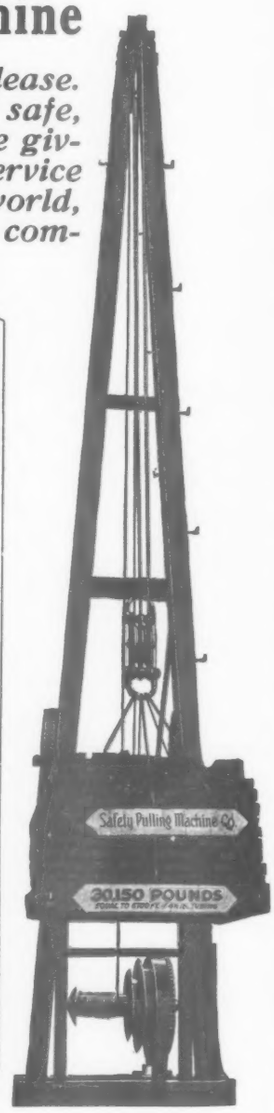

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West Texas to Hold Petroleum Convention At San Angelo, Tex.

SAN ANGELO, Tex., Jan. 14.—This city is preparing to "throw" one of its biggest parties—the third annual West Texas Petroleum Convention—and desires as its guests every one identified with the petroleum industry in the Southwest, particularly those interested in this vast area, Thursday and Friday, January 26 and 27.

The meeting on Wednesday, January 25, of the new Oil and Gas Bureau of the West Texas Chamber of Commerce will attract many oil men who will remain for the convention. H. J. Adair, manager of the bureau, has arrived from Wichita Falls and established headquarters at the office of the Board of City Development. Mr. Adair is visiting the various fields to the west and northwest. The meeting of the Oil and Gas Bureau and the petroleum convention have no connection whatever, but coming close together both will be benefited. The expected attendance is 1,000 while many believe that visitors will number 1,500.

The oil division of the Board of City Development, of which Rupert P. Ricker is chairman, is sponsoring the convention. Dwight L. Hunter, who was chairman of the entertainment committee last year, is general convention chairman in 1928. One of the entertainments will be the banquet of buffalo meat on the Italian roof garden of the St. Angelus Hotel, convention headquarters. On its mezzanine floor is the West Texas Petroleum Club, where the West Texas Geological Society meets monthly.

CENTRAL WEST

(Continued from Page 60)

in the Saginaw sand at a depth of 2,434 feet. The well is said to have done 40 bbls. the first day and 18 bbls. the second day, flowing its oil as it has a gas volume estimated at 500,000 feet. The drill only touched the sand in this well when it made its good showing and will be drilled deeper into the Saginaw sand. Considerable leasing has taken place in the vicinity of the well in the southeastern part of Gratiot County, southwestern part of Saginaw County, northwestern part of Shiawassee County, and northeastern part of Clinton County as the four counties corner a short distance southeast from Ashley.

There is no drilling excitement at Muskegon on account of the extreme cold weather but with warmer weather, it is said a large number of tests will be drilled. It may develop into a larger pool than is the present Saginaw Pool. Much leasing has been done between Muskegon, Michigan, and South Bend, Indiana, where a structure is known to exist that looks favorable as the well 3 miles south from Decatur, in Van Buren County, had a showing of oil, as had old wells drilled in Allegan County.

The Saginaw Field production will undoubtedly be increased the coming season as much drilling will be done outside of the town lot development in Saginaw. To the northern edge of the city are acreage properties which have been only partially drilled and are owned by the larger operating companies and now that the refinery is close at hand to take care of the production drilling will start when the weather is more favorable. The Saginaw Prospecting Co., the pioneer of the field, controls a large amount of the north side acreage, while the Ohio Oil Co., Bliss Petroleum Co., Sun Oil Co., Ohio Fuel Corp., Fordney Petroleum Co., and numerous others have many locations to drill before their acreage is drilled up.

It is rumored that territory southeast of Saginaw Bay and between there and Port Huron will be more thoroughly tested the coming season. Many of the old line operators have looked over that territory and seem to think well of it. The Pure Oil Co. holds a large leased acreage in that area and will no doubt make many core tests during the spring.

KENTUCKY-TENNESSEE

(Continued from Page 60)

was reported run by the three pipe lines making reports from Kentucky, not including the runs of the Stoll Oil Refining Co. which is taking close around 12,000 bbls. monthly from the Glasgow Field in Barren County, also recently connecting to some wells in Tennessee. Of this amount 207,875 bbls. were run from the eastern division and 221,878.42 bbls. from the western division.

The runs of the Cumberland Pipe Line Co., from the eastern division of Kentucky, amounted to 207,875.97 bbls. The runs for the week ending December 10, 50,820.57 bbls.; week ending December 15, 54,059.50 bbls.; week ending December 24, 49,872.74 bbls.; week ending December 31, 53,133.16 bbls.

The Illinois Pipe Line Co. handled through its western Kentucky lines a total of 197,245.46 bbls., or 12,349.92 bbls. less than in November. This was due to the bad weather conditions that existed and the failure to bring in as many new producers as is usually the case in the rich production areas of Ohio and Daviess Counties.

The Paragon Development Co. runs for December from Barren County amounted to 17,734.76 bbls., and from Cumberland, Monroe and Clinton Counties, 6,898.21 bbls., or a total of 24,632.97 bbls.

The Paragon Development Co. ran during December from Clay County, Tennessee fields a total of 2,351.49 bbls., and from Pickett County, 386.02 bbls., making this company's total runs from the two states for December of 27,370.48 bbls., or 1,195.73 bbls. less than for November.

Late Oil Showings

James C. Ellis's No. 1 on the Jane Daniels farm, southeast of the Ambrose Pool, northeast of Mt. Moriah Church and directly west of the north end of the Bob Hamilton farm, is reported making as good a showing as the Hamilton farm well. This adds a slight scope to the big strip lying between the Ambrose Pool and the Sunnydale Field. The finding of 38 feet of sand by Mr. Ellis in his test on the Bud Hoagland farm, 3 miles south of Taffy and far to the south of the Ambrose Pool, that was reported showing for 150 bbls., appears to have opened something entirely new in acreage in the Ohio County Field and should bring about a drilling campaign.

The Parks farm well, drilled by Young, Goldberg and others' in the western part of Ohio County, got a nice showing at 22 feet in the sand and it looks like another good looking pool had been found.

Young, Evans and others' test on the Boyd Bristow farm, in the Panther Creek District, a mile north of the Dimmick well, and three-quarters of a mile north of the McLean County line and in Daviess County, west of Utica, is reported to have filled up with oil, indicating another good producer in wildcat territory. Ernie Henderson has moved a rig for a well on the U. S. Condit 370 acres, a mile south of the Stevens farm, in Daviess County. Jordon, Short and others' are starting a test on the Lindsay Taylor farm, near Masonville, along the Hartford highway, between Habit and Utica and southeast of Owensboro. Livermore parties are drilling a well on the Austin Tucker farm, just east and adjoining the Gilbert Jolly well, and in sight of the initial well of that area in Ohio County.

Leases Recorded

In the year 1927 the greatest increase in any line of business in the Daviess County Clerk's office was in the oil department, where 703 new leases were recorded and 58 old ones transferred to other parties than those specified in the original. In 1926 the leases recorded were but 92.

Gathering Lines

Twenty-six men were taken out to work on extension of the oil pipe line by the Illinois Pipe Line Co., which gave new impetus to the laying and connecting up of the line. It is intended to get this line over to the Dimmick well in McLean County as soon as possible.

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EASTERN FIELDS

(Continued from Page 48)

Empire Gas & Fuel Co.'s second test on the O. Whitney farm is a gasser good for 600,000 feet a day.

In Lot 61, Athens Township, Athens County, the Athens State Oil & Gas Co. has completed No. 9 on the Ohio State Lands. It is a very light pumper in the Berea grit. It may be abandoned. In Section 6, same township, the Strouds Run Oil & Gas Co. has a very light show of gas in the stray sand at No. 3 on the George H. Junod farm.

West Virginia

On Trace Fork, Center district, Gilmer County, the South Penn Oil Co. has drilled deeper into the Big Injun sand its test on the A. N. Selmon farm and it is good for 3 or 4 bbls. a day. In DeKalb district, the Hope Construction & Refining Co. has rigs completed for tests on the Fred and Catherine Wilt farms.

In Walker district, Wood County, B. R. Crippen has a dry hole in the second Cow Run sand at a test on the B. M. Bills farm. In the same district, Peter Smith is drilling in the sand at a test on the Senator Goff farm. In Harper district, Roane County, the South Penn Oil Co. is due in the sand at its test on the Beatrice farm.

In Hackers Creek district, Lewis County, the Stanley Run Gas Co. has completed a test in the Benson sand at a total depth of 4,025 feet and it is a light gas well. In the same district and county, the Clarksburg Mortgage Co. has completed in the Maxon sand a test on the George Jackson farm. It is also a light gasser. In Collins Settlement district, Lewis County, the Mudlick Oil & Gas Co. has completed in the Gordon sand No. 4 on the E. G. Davisson farm. It was given a shot and is good for 2 or 3 bbls. a day. In Hackers Creek district, the Carnegie Natural Gas Co. is drilling to the Benson sand a test on the I. J. Davis farm and the Cumberland & Allegheny Gas Co. is drilling No. 3 on the Albert Stanley farm at 3,900 feet.

Roane County

In Geary district, Roane County, the United Fuel Gas Co. has completed a test on the Mary E. Sarver farm. It is a gasser in the Big Injun sand. In Spender district, Godfrey L. Cabot's test on the Nettie M. Starr farm is a gasser in the same formation.

In Grant district, Ritchie County, Maxwell, Charter & Co. have a duster in the Big Injun sand at a test on the B. F. Kearns farm. In the same district, Mellon & Co. had the same luck when they drilled No. 3 on the Charles S. Lewis farm through the Berea grit. In Murphy district, A. G. Roberts & Co. have a duster in the Big Injun sand at a test on the A. M. Taylor farm.

New Work

In DeKalb district, Gilmer County, Satterfield & Co. are rigging up on the F. H. Gainer farm. In Sheridan district, Calhoun County, the Hope Natural Gas Co. has made locations on the Annie Boyles and A. Hardman farms. In Scott district, Boone County, the Cameron Oil & Gas Co. has part of the rig material at a location on the George P. Alderson farm.

In Freemans Creek district, Lewis County, West Virginia, the Moran Drilling Co. completed in the Big Injun sand its test on the M. Griggs farm. It is a gasser good for 1,000,000 feet a day. In the same district, the Hope Natural Gas Co. has drilled down from the Gantz to the Fifth sand its old No. 1 on the J. C. Starcher farm and is a very light pumper in the lower formation.

Air Pressure Helps

On the Bannester heirs' farm in Elk district, Kanawha County, the South Penn Oil Co. put air pressure on old No. 1 and increased its production from 1 bbl. to 8 bbls. a day, from the Squaw sand. This method for recovering more production is proving a success in Kanawha County. The best results are attained in the shallow sands.

In Sheridan district, Calhoun County, W. H. Bickel has now drilled No. 5 on the James Wolverton farm through the Berea grit and dry.

In Clay district, Marion County, the Carnegie Natural Gas Co. has a gasser in the Fourth sand at a test on the Mahlon Tennant farm. In Pawpaw district, same county, the Owens Bottle & Machine Co. test on the William Valentine farm is a duster in the Fifth sand.

On McFarlan Creek, Murphy district, Ritchie County, Clarence Simpson has completed in the Big Injun sand his test on the M. Tingler farm and it is a duster.

In Center district, Gilmer County, the Hope Natural Gas Co. has completed in the Maxon sand its second test on the Nancy Ayers farm, good for 25 or 30 bbls. a day.

On the left fork of Alley Branch of Breedens Creek, Harvey district, Mingo County, the Public Service Gas Corp. has drilled No. 26 on the Logan Cannel Coal Co.'s property in to the Maxon sand, showing for an 8-bbl. pumper.

Gassers in Lincoln County

In Duval district, Lincoln County, D. G. Behler has a gasser in the Berea grit at a second test on the J. V. Reishman farm. In Union district, the Columbia Gas & Electric Co. has a gasser in the same formation at a test on the S. W. Oxley farm. In the same district, G. I. Ray & Son have started to drill a second test on the Mathias Stowers farm. In Jefferson district, Pridemore & Adkins are drilling a test on the E. G. Stone farm. In the same district, the Mud River Gas Co.'s test on the E. Adkins farm is a light gasser in the Berea grit.

In Spring Creek district, Wirt County, the Dailey Oil Co. has completed a test on the A. C. Adair farm and is dry in the Berea grit. A light show of oil was developed in the first Cow Run sand.

In Murphy district, Ritchie County, the Hope Construction & Refining Co. has completed in the Big Injun sand No. 3 on the Noah Jordon farm. It is a 3-bbl. pumper.

In Coal Township, Harrison County, the Clarksburg Light & Heat Co. has a Fifth sand gasser at No. 257 on the Gore-Reynolds farm.

Starting New Work

In Union district, Wood County, Rothwell & Co. are rigging up on the John Freshwater farm. In Cove district, Doddridge County, Ira Cox has started to drill on the Levi Spurgeon farm.

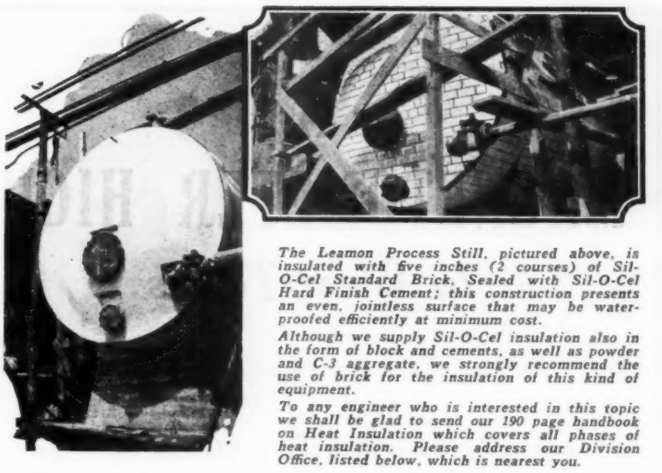
In Mannington district, Marion County, the Clifton Oil & Gas Co. has skidded the rig at its No. 4 on the O. N. Coen farm. In Eagle district, Harrison County, the White Top Oil Co. has started to drill on the J. F. Allen farm.

In Grant district, Ritchie County, the Mason Farm Oil Co. has a rig up on the N. T. Mason farm. In Murphy district, L. M. Cunningham & Co. are building a rig on the G. W. Haines farm. In McKim district, Pleasants County, Hall & Co. have shut down at 1,936 feet on the A. L. Shultz farm.

In McComas district, Cabell County, the West Virginia Gas Co. is due in the sand on the Irving Morrison and Calvin Simpson farms. In Scott district, Boone County, the Cameron Oil & Gas Co. is building a rig on the George P. Alderson farm. In the same district, the United Fuel Gas Co. has made five locations on the Horse Creek Coal & Land Co.'s tract. In the same district, the Hope Construction & Refining Co. is due in the Big Injun sand on the J. M. Hill farm. In the same district, the Cameron Oil & Gas Co. has made five locations on the George P. Alderson farm. In Grant district, Doddridge County, Trainer Brothers have made the location for a test on the A. E. Martin farm.

In Ravenwood district, Jackson County, the Producers Oil & Gas Co. has part of the rig material at a location on the Kenna Skeen farm. In Cove district, Doddridge County, Ira Cox is due in the Keener sand on the Molly Griggs farm. In Murphy district, Ritchie County, J. G. Cothran is rigging up on his own farm.

In Duval district, Lincoln County, the United Fuel Gas Co. is fishing on the William Gillenwater farm. In Union dis-



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I will begin the well by April first and drill it to a depth of 3,500 feet.

In order to reduce my hazard on this project, I will offer for sale at a fair and equitable price several spreads of acreage around the well. Each spread will contain 1,120 acres including a 160-acre tract offsetting the 160 on which the well will be drilled.

I have new, ten-year leases (one or two exceptions) on the new 88 Lease Form that provide for an annual rental of only twenty-five cents per acre. Oil at a very shallow depth was recently found in the county. The logs of wells drilled in that area show a sand condition that is very favorable. There are two other wells to be drilled, north and south of my location, within the next six months. There is every reason why this test should be made.

If you are interested in buying a good spread of acreage and making a play around this test I shall be pleased to send you maps, geological report and complete data on request.

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WICHITA FALLS, TEXAS

trict, Roy & McComas have started to drill No. 3 on the Randolph Sias farm. In Barboursville district, Cabell County, J. W. Crotts has rigged up to drill a test on his own farm. In Sheridan district, Calhoun County, Godfrey L. Cabot has made a location of the S. J. Ferrell farm.

On Strait Fork, DeKalb district, Gilmer County, the Hope Construction & Refining Co. has started to drill a test on the Frederick Wilt farm, about 2,000 feet west of the South Penn Oil Co.'s test on the Perry Black farm. In Sheridan district, Calhoun County, Smith & Starcher are rigging up on the Anna Slider farm. In Center district, W. H. Bickel has rig material at a location on the John J. Sturm farm. In Sherman district, C. B. Lewis has started to drill on the Spencer White farm. In Sherman district, Martin Crawley is building a rig on the John A. and Michael Buck farm. In Otter district, Braxton County, the United Gas Co. is rigging up on the D. S. and C. Engle farm.

Southwest Pennsylvania

In Springhill Township, Greene County, the Dunmar Oil & Gas Co. has drilled deeper its second test on the Harvey Renner farm and it is a gasser in the Gordon sand. In the same township, W. R. Tagg has shut down at 2,470 feet on the J. D. Dukate farm.

In Springhill Township, the Sinclair Oil & Gas Co. drilled in a test on the A. M. Snider farm. It was drilled deeper a few days ago and the ownership changed to the Null Oil & Gas Trust and it is good for 2 bbls. a day in the Gordon sand. The test on the S. M. Snider farm drilled in by R. Morehead has been drilled deeper and is good for 10 bbls. a day in the Gordon sand. The name of the ownership has been changed to the Springhill Oil & Gas Co.

CALIFORNIA FIELDS

(Continued from Page 58)

feel they are also entitled to one or more producers in the deep sand.

Up to the present time the Associated, Marland and Standard have wisely refrained from drilling below the Selover zone in the older section of the field but this unwritten agreement may be terminated at any time. The Marland's Selover property abuts the Alamitos Heights town lot area where operators have been producing from the Wasem horizon for several months. The company's action in taking steps to prevent any undue drainage from deep drilling therefore is entirely justified but this move naturally affects the adjoining acreage of the Standard and Associated, both of which it would seem are entitled to a certain equity. The situation calls for the exercise of diplomacy and an equitable adjustment all around. It is quite possible that these three companies may effect a gentleman's agreement which will curtail both drilling and production for unless some understanding is reached in the near future increased drilling operations during the next six months may result in a substantial increase in the production of this field.

Huntington Beach

J. A. Brower's well in the extreme southeastern part of the Huntington Beach Field staged a short blowout during the early part of the past week and the preliminary flow indicated a possible yield of around 200 bbls. per day, although this is based on a run-away performance and therefore subject to revision. This well, which is located at Chicago and Huntington Avenue, started to flow from 5,357 feet while the hole was being cleaned out but it died a short time later, however, and the crew has been bailing salt water for the past two or three days. A string of 6¼-inch had been landed at 5,225 feet and it is probable that a second cement job will be undertaken before another production test is made. The well in question is several hundred feet west of the Standard Oil Co.'s Surf property which has been producing small consistent quantities of light oil for several years. This immediate section of the field has never been considered seriously because of existing irregularities due probably to faulting and dry holes have been quite numerous, although it may be possible that many of them were not carried deep enough before abandonment.

Rosecrans

The only development of interest in the Rosecrans Field during the week was the abandonment of the Barnsdall's No. 1 O'Dea at 4,715 feet. The company's No. 9 O'Dea is still drilling ahead at 5,356 feet, however, with a good chance for deep production. Drilling operations in the Dominguez and Torrance Fields have not shown any change for several months and both fields will continue in status quo indefinitely. The St. Helens Petroleum is scheduled to make a production test of No. 16 Monterey in the Montebello Field from the 3,600-foot level some time during the next 24 hours with normal production in sight. Mechanical trouble has prevented the Shell from carrying No. 40 Columbia in the Brea Olinda Field on down for a deep conclusive test and the hole is being plugged back to around the 4,600-foot level. No. 2-A Puente, another deep project, has been converted into a gas receiver, the object being to repressure the depleted Puente sands.

Northern California Wildcats

Wildcatting activities in the northern part of the state were featured by several interesting developments during the week, the most important of which was the logging of a second oil sand in the Pacific Eastern's Union Avenue test near Bakersfield in Kern County. The importance of this find lies in the fact that even though this specific well may not result in commercial production it has indicated the possible existence of oil in commercial quantities in this area. This wildcat has also shown that two separate sands may be anticipated, a favorable omen for large production. The Pacific Eastern's wildcat at Fruitvale, several miles northwest of the Union Avenue area, has also encountered an oil sand which some believe corresponds with the upper zone encountered at Union Avenue. These districts are by far the most important wildcat areas under development at the present time and both will bear watching during the next 30 days.

The Shell has a rig up on a 10,000-acre tract located approximately 15 miles west of Wasco in the Lost Hills area and this property, which is held jointly by the Shell and J. N. Kerwin, owner of the lease near Edison on which the General Petroleum has just finished a new producer, will be given a thorough conclusive test. The joint lease held by Mr. Kerwin and the Shell company covers all or part of 18 sections forming a huge triangle lying north of and adjacent to the state highway in the vicinity of the Goose Lake Drainage Canal. The attempt of Long Beach operators to wildcat the district in and around Shafter has met with a temporary setback because of the inability to secure sufficient acreage to justify the expenditure necessary for a conclusive test.

Southern California Wildcats

Considerable interest is being manifested in the Potrero district, located between the Rosecrans and Inglewood Fields in Southern California, due to the entrance of the Petroleum Securities into this area and the coring of what is reported to be a good looking sand in Smith & Carpenter's test which was originally drilled to 5,282 feet by the Julian Petroleum Corp. and abandoned at that depth. Smith & Carpenter took over this abandoned well several weeks ago and resumed drilling after rebuilding the rig and cleaning out the hole. A string of pipe has just been landed and this project, which has been cored solid from 5,282 feet to 5,415 feet, will be given an early test. The Petroleum Securities will spud in No. 1 Connolly within the next few days and this wildcat, which is approximately 1 mile northwest of the Associated's No. 1 Cypress, will be watched very closely during the course of work. The Associated's No. 1 Cypress, incidentally, staged a short blowout dur-

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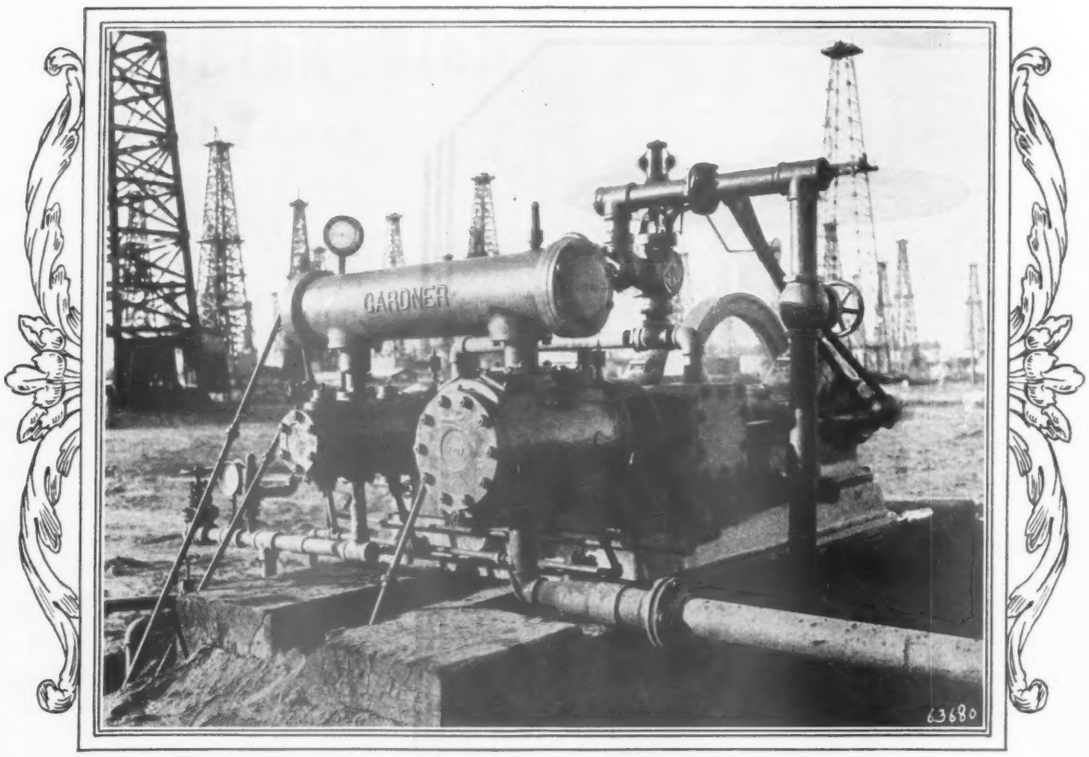

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ing the early part of the week while standing for a water test and the kick displayed is indicative of an early possible completion. This project has definitely proven up the existence of two separate horizons but water trouble has so far prevented a satisfactory completion in either one. This trouble may be corrected at any time, however, and No. 1 Cypress put on steady production. The Associated has mapped a location for a second project at Potrero and while material has not yet been placed on ground this may be done in the near future as it is understood that lease requirements call for an early spud.

The Shell is plugging back its No. 1 Mission, a wildcat in the San Fernando Valley, and a production test will be made from somewhere around 4,350 feet before abandonment. It is quite probable that the mechanical trouble which developed in this hole several weeks ago was a contributing factor toward the production test to be made in the near future as the possibility of developing production in No. 1 Mission is not very encouraging, in fact the odds are all the other way. The San Clemente Oil Co.'s No. 1 Peck, a wildcat at Hawthorne, has taken on a rather favorable outlook at 5,765 feet and if a satisfactory water shut off has been effected it may be possible to secure production. It is rather difficult to make a satisfactory test on this hole, however, because it has been necessary to use a combination 2½-inch and 3-inch oil string because of the several other strings of pipe already in the hole. This well has 545 feet of 16-inch, 5,170 feet of 8¼-inch and a 450-foot 6¼-inch liner landed at 5,495 feet in addition to the combination string recently run in. The Associated's Pico wildcat, No. 1 Patterson, is still held up due to a twistoff which left several stands of drill pipe in the hole. The Monterey Park Oil Co.'s No. 1 Browning, a wildcat at Monterey Park, has passed into an extremely hard formation at 3,750 feet and the outlook is not any too encouraging.

ROCKY MOUNTAIN AREA

(Continued from Page 55)

Creek Field, has been completed at 2,900 feet and is rigging up for pumping test.

Colorado

The Platte Valley Petroleum Co.'s No. 1 Patterson, SW Section 24-6n-61, on the Greasewood structure in Weld County, Colorado, is attracting considerable attention as a result of an oil showing believed to be coming from above the Dakota sand. The location is approximately 50 miles east and a little south of the Wellington-Fort Collins Pools in Larimer County, and 4 miles northwest of the town of Orchard and 20 miles northwest of Fort Morgan. The structure has been known for a number of years and has been geologized many times, but operators held back on proposals to test it on the theory that the Dakota beds were too deep for practical drilling. Discouraged by the hesitancy of the major companies in undertaking a test in the general northeastern Colorado region, citizens of Fort Morgan, with the aid of Chicago people, formed the Platte Valley company and spudded in its Patterson well on May 6, 1926. The test ran into water at 1,261 feet in black shale followed by a 20-foot streak of sandy shale which yielded a slight show of oil. Drilling continued at intervals until September, 1927, when at 3,200-85 feet a sand was cut showing a little gas, salt water and scums of oil. This horizon was believed to be the so-called Nio-Benton sand between the Niobrara and Benton shale beds. Most authorities agree that this does not correlate with the Wall Creek, or Frontier sands of Wyoming which are not believed to be in place in northeastern Colorado but more nearly with the Carlisle shale which lies above the Frontier in Wyoming. If this interpretation is correct the Muddy sand of the Dakota series might be expected approximately 600 feet below the Nio-Benton.

After striking the salt water, the well was shut down at 3,640 feet until the past week when additional financing was completed. The salt water horizon had been cased off with the 6¼-inch and the hole was dry. However, the salt water backed by gas pressure, has continued to flow from between the 6¼-inch and 10-inch casings. When drilling was resumed, the hole was carried to 3,650 feet when some oil and considerable gas commenced showing. The oil is standing on the water used in drilling and in sufficient quantities to permit the taking of samples. President F. J. Kirchoff, upon returning from the well, said the prospects were very encouraging and that the hole is believed to be bottomed just off a sand. According to the logs of wells drilled nearer the mountains, the well ought to be close to the first sand in the Dakota if the identification of the sand at 3,200-85 feet as the Nio-Benton is correct. In that event, it will prove that the beds in northeastern Colorado are not as deep as predicted. Thirty miles to the east, the Northeastern Colorado Oil Co.'s No. 1 State, Section 36-8n-55, in Logan County, topped the main Dakota sand at 5,317 feet, and is drilling for the Lakota at 5,534 feet. Nearest point on which elevation data is available is Fort Morgan 20 miles to the southeast, which lies 4,240 feet above sea level. In as much as the terrain raises slightly towards the mountains, it is apparent that the salt water at 3,200 feet was encountered above sea level, indicating a closed structure.

Moffat Dome

The Texas Production Co.'s No. 10 Knowlton, Section 33-5n-91, on the Moffat Dome in northwestern Colorado, is being given a production test from the Sundance sand at 4,400-27 feet. The well pumped 85 bbls. in 12 hours after which the rods were pulled. When pumping was resumed, it made 136 bbls. in 24 hours. Previous to producing this sand the Morrison was making around 100 bbls. natural between the 6¼-inch and 4½-inch casing. The Morrison sand has ceased to flow. Whether this means that the oil in the Morrison is working its way around the casing shoe into the Sundance, or that the Sundance had been feeding the Morrison, has not yet been determined. The first theory is considered most likely, however, since the Sundance is separated from the Morrison by a hard and impervious formation.

On the Iles Dome no new developments of importance have taken place. Midwest Refining Co.'s No. 34-SD Parkinson, SE SW, Section 22-4-92, which is feeling its way into the Sundance, is drilling in sandy black shale at 3,197 feet. It had 11,000,000 feet of gas in the Morrison and is higher on the structure than the discovery which made 2,600 bbls. initial. Same company's No. 8-SD Parkinson, NW NW, Section 23-4-92, cemented the tools at 1,759 feet to sidetrack. No. 33-SD Parkinson, SW SE, Section 22, is digging cellar, and No. 7-SD Parkinson, NW NW, Section 23, is rigging up. No. 1-SD Parkinson, NE NE, Section 22, is building rig, and No. 18-SD Parkinson, NW NE, Section 22, is digging cellar. Texas Production Co.'s No. 17 State, NW SE, Section 15-4-92, joint with the Kinney-Coastal Oil Co., is spudding in shale at 36 feet, and same company's No. 6 Parkinson, NW NW, Section 23-4-92, is sidetracking at 2,513 feet, with a total depth of 2,590 feet. No. 13 Parkinson, NE SW, Section 22, is waiting for cement to set at 1,300 feet. Shaffer Oil & Refining Co.'s No. 205 Yarg, NW NW, Section 26-4-92, joint with the Yarg Producing & Refining Co., is drilling out cement at 3,005 feet at which depth the 10-inch was set. This well is on the flank and much deeper than any drilling operation and will yield valuable information as to the limits of the producing area.

Hiawatha Dome

On the Hiawatha Dome, the Reiter-Foster Oil Co.'s No. 1 State, SE SE, Section 16-12n-100, reported last week to have cut a water sand, supposedly the

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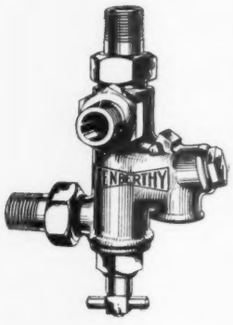

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same sand which made 35,000,000 feet of gas in the Ohio Oil Co.'s No. 1 Kuykendall on Section 22, found the sand at 2,174-2,215 feet. Drilling is to continue.

Negotiations are being concluded for another Sundance sand structural test in Moffat County, to be located on the Elk Springs Dome in the western part of the county, 50 miles west of Craig. California parties are reported to have taken over the block of leases on this structure held by the Elk Springs Oil & Gas Association. The Union Oil Co. of California tested the structure two years ago in its No. 1 Morgan, Section 31-5n-98, and abandoned it at 3,973 feet. It had a flow of 8,000,000 feet of gas in the Dakota but did not drill to the Sundance which was proven on the Iles Dome subsequent to the abandonment of the Elk Springs test. Identity of the operating company and location of test will be disclosed as soon as the contracts are signed.

In Rio Blanco County, the Midwest Refining Co.'s No. 2 Rangely, Section 30-2n-102, on the Rangely Dome, is drilling at 3,415 feet and underreaming. It was through the Dakota at 3,090 feet where the 6¼-inch was cemented, and had a gas sand at 3,350-58, in the upper Morrison. The Texas Production Co.'s No. 1 Freeman, Section 27-3n-94, Wilson Creek Dome is making slow progress on account of the depth of the hole and troublesome formations. It is drilling in black shale at 5,265 feet, with the 6¼-inch at 5,254 feet. Nothing was expected in this test under 5,300-5,500 feet, but it is now getting to an interesting stage. The Argo Oil Co.'s No. 1, Section 9-2s-96, a Tertiary test on the Piceance Creek structure, has been delayed in spudding on account of bad roads. It probably will be another two weeks before it gets under way. Oil for fuel is being trucked from the Iles Dome.

Southwestern Colorado

The Moody Oil Corp.'s No. 1, Section 30-41-16, on the Glade structure, in Dolores County, southwestern Colorado, is shut down at 3,802 feet because of the exhaustion of the supply of fuel oil on hand for drilling purposes. Deeper drilling operations are contemplated immediately if weather conditions permit, otherwise, operations will not be resumed until spring. There appears to have been some confusion in regard to the status of the operation, and Coe S. Mills, who mapped the structure for the Transcontinental Oil Co., which company has an interest in the operation, says the test is still drilling in the Cutler formation (Permian in age) and is believed to have stopped only a few feet above the top of the Hermosa formation (Pennsylvanian in age). The prospective oil and gas horizons of the upper Hermosa formation, as revealed in the McElmo well completed by the Midwest Refining Co. 28 miles southwestward in Montezuma County, have been the objective from the start of this test well and until these zones are tested, the situation is just the same as if the well had never been started.

Some activity in oil shale lands in western Colorado is taking place. R. J. Graf and A. C. Dieriex have paid $17,294 into the district land office at Denver in fees in connection with the applications for patents on claims held in their names. It is understood the Graf group of claims is held for the Shaffer Oil & Refining Co., comprising 4,415 acres, and the other group for the Honolulu Consolidated Oil Co., and embrace 2,502 acres. Final papers on holdings of the Standard Shale Products Co., embracing 10,560 acres are expected to be filed shortly. These will be accompanied by checks for $26,400. Continental Oil Co. is said to be interested in the Standard Shale holdings.

In the Florence district in Fremont County, a good completion was reported in the Mojada Oil & Gas Co.'s No. 3 Hassel, Section 21-20-69, in the south extension. The well was drilled to 1,800 feet some months ago and was a pumper. It was deepened 150 feet the past week to 1,950 feet and came in making 100 bbls. initial.

Completion of the Continental Oil Co.'s No. 1 Hoye, Section 34-9n-78, on the South McCallum Dome in Jackson County, has been delayed by a fishing job at 4,540 feet.

New Mexico

The Texas Production Co.'s No. 2 Robinson, NW cor. SW, Section 25-16-31, in eastern Eddy County, picked up another show of oil at 4,030 feet after resuming drilling at 4,012 feet. Previous to the resumption of drilling the well had swabbed 220 bbls. in a 24-hour test from sand at 3,990-4,010 feet. At last reports the well was drilling at 4,070 feet and probably will be completed at 4,150 feet. The show at 4,030 feet was in sandy lime. The well was flowing by heads making 35 bbls. at each flow and heads coming three times per day, or a total of 145 bbls. daily. When this well is finished, the plans are to go back into No. 1 Robinson and deepen it to the lower horizons in which oil was found in No. 2. The hole in No. 1 Robinson will have to be cleaned of a bit at the bottom, however, before any new depth can be made. Further drilling operations in the vicinity of this well have not yet been decided upon, but it is practically certain that the area will be given a thorough test as soon as possible.

Interest in this area was materially increased the past week by the performance of the Skelly Oil Co.'s No. 1 Beulah Lynch, SE cor., Section 22-17-31, a mile to the south of the Robinson wells and on the west side of the Maljamar Pool. This well had been drilled to 4,269 feet when plugging back commenced. It was plugged back to test horizon at 3,769 and 3,622 feet where it made 18 bbls. with a little water. The quantity of oil showed an increase of about 2 bbls. a day and the water disappeared. The past week it was shot with 15 quarts at 3,759-69 feet and the hole filled up 1,400 feet in the first hour. It was swabbed during the next 23 hours and made 60 bbls. In the next 24 hours it swabbed 60 bbls. and the well was listed as a completion with an initial production of 60 bbls. a day. This well on the west side and the Robinson wells on the northwest make the Maljamar Pool, which extends over into Lea County, much more promising than it has looked for some time. Other operations in Eddy County were most routine. Getty Oil, Inc.'s No. 1 Nicholas, NW cor., Section 25-20-29, in the vicinity of its No. 1 Hinkle which is shut in as a producer, commenced spudding December 31, and is drilling at 200 feet in red shale. R. D. Compton's No. 4 Mann, Section 4-18-27, is drilling below 1,775 feet, and the Hammond Oil Co.'s No. 1 Miller, SE SW, Section 15-16-25, is shut down at 1,637 feet. Pueblo Oil Co.'s No. 1 Gessert, south of the Robinson wells, in NW Section 1-17-31, is running the 8¼-inch casing to carry. Total depth is 3,705 feet where gas was encountered, blowing the tools 30 feet up the hole where they lodged. Woolley and others' No. 1 McIntyre, C SW, Section 21-17-30, about 1½ miles to the west of the Skelly well, has been completed as a gas well at 1,850 feet, the production being 1,000,000 feet. Levers & Carpers' No. 5 State, Section 5-18-28, is drilling in lime at 2,722 feet.

Lea County

In Lea County, the Marland Oil Co.'s new test in its No. 1 Eaves, SW cor. SE, Section 19-26-37, to the west of the Texas Production Co.'s No. 1 Rhoades, is getting under way. A water well is drilling and rig is being built for the deep well. This is the first operation in the vicinity of the Rhoades discovery to get under way. The Texas Production Co. is preparing to put down at least one more test at once and location will be announced within the next week or two. The Inglewood & Bridges' No. 1 State, Section 4-17-34, 12 miles northeast of the Maljamar Pool, failed to show anything after being shot and is being abandoned at a total depth of 5,329 feet. Cecil Bordages' No. 1 Hughes, Section 27-19-38, is drilling at 895 feet, and the

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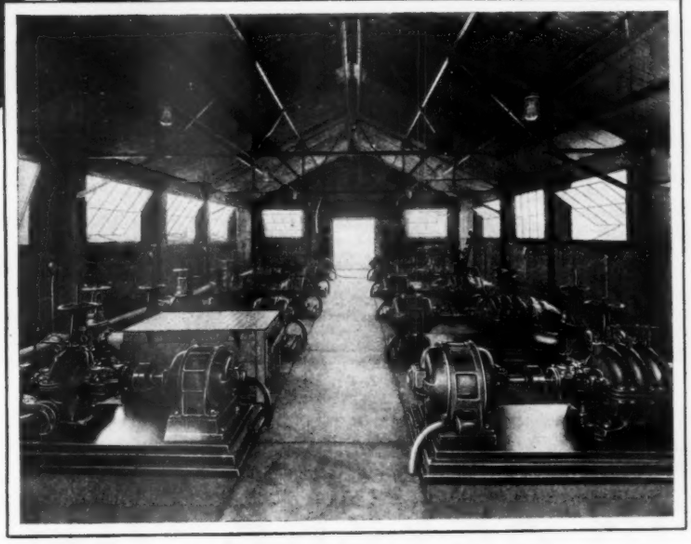

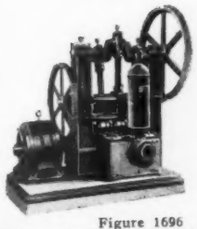

Figure 1696
Goulds Single-Acting Triplex Pump

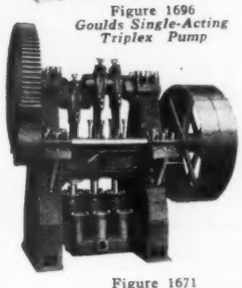

Figure 1671
Goulds Single-Acting Triplex High Pressure Pump

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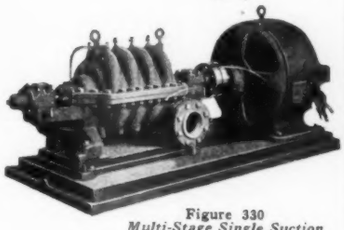

Figure 330
Multi-Stage Single Suction Centrifugal Pump

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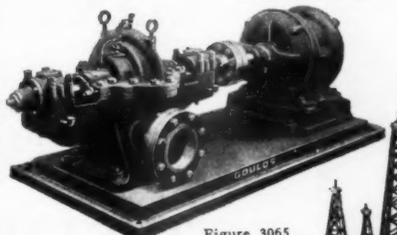

Figure 3065
Single Stage, Double Suction Centrifugal Pump

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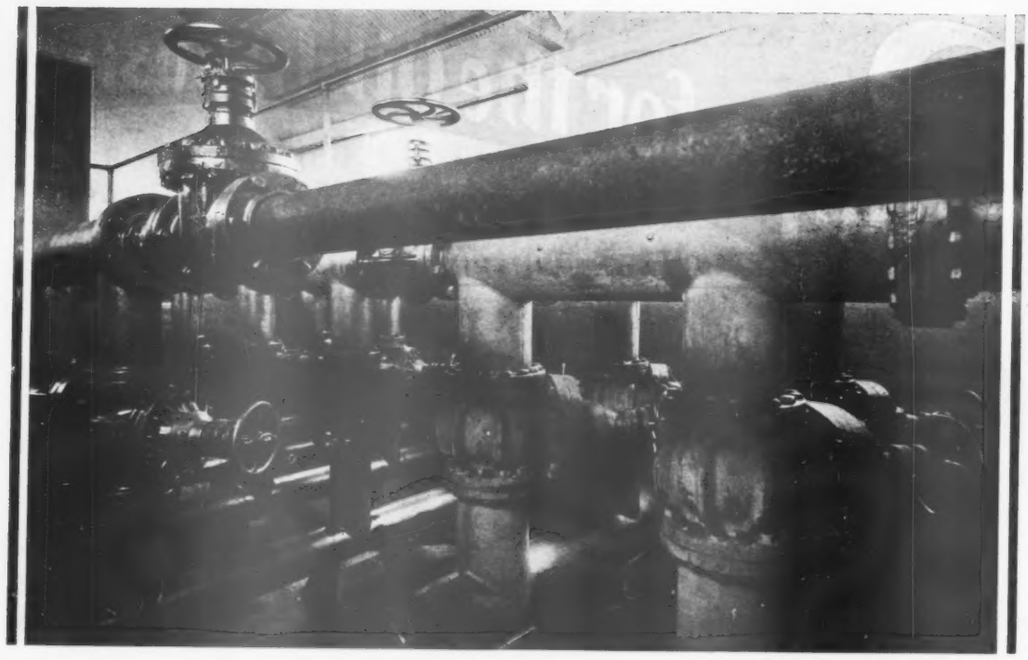

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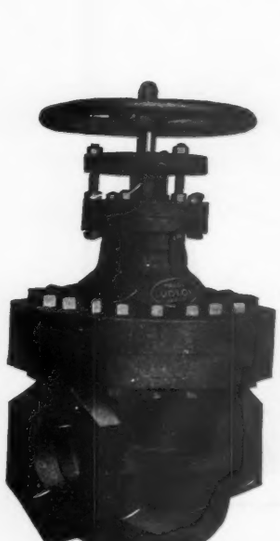

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Maljamar Oil & Gas Co.'s No. 2 Beardsley, SE NE, Section 15-17-32, is fishing for tools at 4,070 feet. Midwest Refining Co.'s No. 1 State, NE NE, Section 9-19-38, in the Hobbs area, is drilling in red shale at 1,520 feet.

In Quay County, the Ohio Oil Co.'s No. 1 Sam Wells, Section 24-7-29, in the Jordon Ridge district, is drilling below 4,890 feet.

In the northwestern part of the state, the Producers & Refiners Corp. has decided to drill another test on the Hospah Dome in McKinley County, and is building rig for its No. 2, in Section 12-17-9. It recently abandoned a test in the NE NW, Section 12. These locations are on the south flank of the structure. The Reliance Oil Co.'s No. 1 Valentine, Section 15-17-9, is reported to have encountered oil in its test, but it was shut in for lack of storage and no information is yet available as to the depth or quantity of oil. The Continental Oil Co.'s No. 1 Carica, Section 9-17-7, is drilling at 2,950 feet.

San Juan County

In San Juan County, the Huntington Park Oil Co.'s No. 1 Terwilliger, Section 29-30-9, in the Blanco area, is drilling ahead below 4,150 feet and is reported to be about 6 feet in the Point Lookout formation with considerable gas in the hole. It ought to be known soon what this test will reveal. The casing was set at 4,160 feet and at 4,162 feet it commenced showing the gas. It then went through several feet of solidified paraffin with a thin stratum of coal, and at 4,165 feet, was in lime. Union Oil & Mining Co.'s No. 2 Pine, Section 8-29-9 is reported to have lost another string of tools in the hole while fishing for the last of the several strings which have blocked progress for more than a year. San Juan Petroleum Corp.'s No. 2 San Juan, Section 9-29-13, on the edge of Farmington, is underreaming to lower casing to bottom at 1,050 feet before drilling into a sand. A Johnson, trustee's No. 1, Section 34-29-11, in the Kutz Canon district, is drilling at 600 feet in a 10-inch hole. The Kirkland Drilling Co.'s No. 1, Section 10-20-15, in the Kirkland-Fruitland district in the southern part of the county, is about through the boulders which gave considerable trouble at 100 feet. This test is headed for the Mesa Verde sands.

The Clovis Oil & Gas Co.'s No. 1 Hoskins, NE Section 21-3n-36, in Curry County, is drilling in black shale at 3,850 feet.

Utah

The Texas Production Co.'s No. 1 Shipley, Section 5-27-14, on the Sweetwater structure in the Nequoiah Arch, west of the Moab operation, struck a white water sand at 2,745 feet and is bottomed at 2,765 feet with the hole caving. Cleaning out is in progress. The character of the formation drilled the past week is chiefly sandy lime. Phillips Petroleum Co.'s No. 1, Section 16-27-16, on the Barrier Creek anticline in Wayne County, is still waiting for completion of road so materials may be moved to location. The Utah Southern Oil Co.'s No. 1 John L. Shafer, Section 36-26-20, on the Cane Creek Dome, has installed an engine and is rigging up. Spudding will start this week. This is a flank test on the salt dome which failed to yield commercial production on the top. Same company's No. 1 Frank Shafer, the discovery well on the top of the structure, is being pumped at intervals to supply oil for drilling. Same company's No. 1 Canyon, Section 18-41-19, on the east anticline in San Juan County, is making progress with a diamond drill slowly at a total depth of 1,500 feet. Continental Oil Co.'s No. 1 Boundary Butte, Section 23-43-22, in San Juan County, is drilling at 2,140 feet and is reaching an interesting stage as the first sand in the Pennsylvanian is expected shortly. Hiatt's No. 1, NW Section 17-43-15, on the Beehive Dome in Washington County, is spudding at 65 feet and drilling in sandstone. The Mid-American Oil Co.'s test on Section 17-43-15, Bloomington Dome in Washington County, has succeeded in penetrating

(Continued on Page 139)

LOUISIANA-ARKANSAS

(Continued from Page 52)

Section 13-21-15, at 3,505 feet to get around a stuck drill stem, total depth 4,090 feet. Dixie Oil Co. has cemented 6⅝-inch casing at 3,938 feet in No. 9 Clark, Section 14-21-16; No. 90 Dillon, Section 14-21-15, set 4½-inch casing at 3,921 feet; No. 92 Dillon, Section 13-21-15, is setting 8-inch casing at 3,806 feet; No. 1 D. A. Huckaby, Section 33-21-15, is drilling shale at 2,025 feet and No. 4 H. H. Huckaby, Section 11-21-15, is drilling at 3,690 feet after testing dry at 3,675 feet.

Gulf Refining Co.'s No. 14 Tyson in Section 14-21-15, is changing over to rotary tools at 3,944 feet after it was decided not to put it on the beam at 3,939 feet to pump from that depth. Magnolia Petroleum Co. cored lime at 3,724 feet in No. 8-A Hampton, Section 15-21-15; No. 22 Robert Shaw, Section 23-21-15, cored limey shale at 3,565 feet. Ohio Oil Co.'s No. 25 E. K. Smith, Section 12-21-15, is drilling a hard sand at 5,823 feet. Pittsburg Oil & Development Co. has rigged up to deepen No. 1 Herndon, Section 15-21-15, abandoned as a salt water hole last November at 3,948 feet, and is reaming to bottom. Simplex Oil Co. has derrick up for No. 1 Baird, 1,220 feet west and 200 south NE cor. Section 22-20-15. Standard Oil Co. began drilling No. 17 J. J. Hart, Section 34-21-16, January 8, and is in shale and boulders at 712 feet.

The Texas Company has cemented 8¼-inch casing at 3,684 feet in No. 8, A. Herndon, Section 14-21-15; No. 9 on the same "40" is drilling lime at 2,852 feet. No. 10 J. K. Harold, Section 14-21-15, is waiting on standard rig at 3,925 feet and No. 19 D. H. Raines in Section 15-21-15, is drilling red shale at 4,423 feet.

Mooringsport—Bee Oil Co.'s No. 1 Muslow, Section 29-20-15, is drilling at 1,129 feet.

DeSoto Parish

American Controlled Oil Co. is drilling No. 2 Lanier, Section 5-11-11, at 2,741 feet.

Monroe District

Morehouse Parish—Consolidated Carbon Co.'s No. 1 Perry, Section 14-20-4, is drilling at 1,987 feet. Moody & Seagraves began drilling No. 1 Wolf, Section 13-20-4, January 5 and have 12½-inch casing set at 180 feet. The Texas Company is drilling shale at 1,200 feet in No. 1 Myers, Section 15-22-7.

Ouachita Parish—Imperial Oil Co. is rigging up to drill No. 4 Stubbs, Section 13-19-3. Palmer Corp.'s No. 3 West Virginia Co. in Section 5-18-4 is drilling at 2,125 feet. Peerless Carbon Co. has made location for No. 3 Moore 1,805 feet north and 218 east of the common corner of Sections 25, 26 and 49-20-4.

Union Parish—Natural Gas & Producing Co. began drilling No. 1 Waldrop, Section 7-21-3, January 7 and has made 179 feet of hole.

Richland Parish

Gulf Refining Co. killed blow-out of No. 1 Millsaps, Section 8-17-6, which burned for a day or two and is rebuilding derrick preparatory to going deeper. After the fire was out the well was estimated to be making about 5,000,000 feet of gas, total depth 2,428 feet with the bottom in top of the sand. No. 3 Rhymes, Section 28-17-6, has rig up to drill. No. 2 Wayne Lumber Co., Section 23-16-5, is bailing to test at 2,453 feet after deepening the hole two feet where it tested dry last November. No. 1 Ches Wymons, Section 20-18-6, is setting 12½-inch surface casing at 917 feet.

Moody & Seagraves' No. 1 Hatch, Section 34-16-5, is drilling at 1,600 feet; No. 2-B Hemler, Section 6-15-6, is in black shale at 2,405 feet; No. 1-C Hemler, Section 29-16-6, is drilling at 1,875 feet; No. 1 LaFleur, Section 18-16-6, has cemented 10-inch casing at 920 feet and No. 1 McDonald, Section 9-15-5, is drilling at 100 feet; No. 1 Osborn, Section 14-15-5, bailed dry at 2,474 feet and is drilling on a rock at 2,480 feet.

Natural Gas & Fuel Corp.'s No. 1 Sartor & Phillips, Section 9-16-6, is drilling at 1,850 feet after setting 10-inch casing at 919 feet; No. 1-A Thompson, Section

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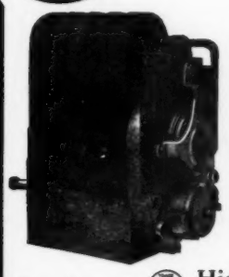

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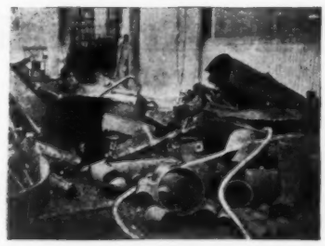

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21-16-6, is drilling at 2,100 feet. Ouachita Natural Gas Co. is drilling No. 1 Cummings, Section 24-17-5, at 1,200 feet. Stovall Drilling Co.'s No. 1 Dunning, Section 26-16-6, is down 2,392 feet and drilling. United Carbon Co. began drilling No. 1 Mulhern, Section 20-16-6, January 7, and set 12½-inch surface casing at 192 feet.

Webster Parish

Cotton Valley—Humble Oil & Refining Co. is drilling anhydrites at 4,142 feet in No. 5 J. Babb, Section 14-21-10, and has 4¾-inch casing cemented at 4,167 feet in No. 1 M. E. Curry, Section 26-21-10. Magnolia Petroleum Co.'s No. 1 G. W. Cole, Section 27-21-10, is in hard lime at 3,947 feet; No. 1 D. G. Cox, Section 22-21-10, is in hard lime at 3,635 feet. Ohio Oil Co. No. 38 Bodcaw, Section 14-21-10, is in chalk rock at 2,238 feet and No. 1 Crichton, Section 21-21-10, in the same stuff at 2,374 feet. Woodley Petroleum Co. went back to No. 1-B Cox, Section 23-21-10, completed last October as a 4,000,000-foot gas well at 4,438 feet, drilled it to 4,737 feet and bailed it in as the same size gasser but with lots of salt water and a small amount of 50 gravity oil.

Sarepta and Shongaloo—Magnolia Petroleum Co. is drilling chalk in No. 1 H. L. Munn, Section 29-23-9, at 2,060 feet; No. 1 J. L. Munn, Section 36-23-19, set 10-inch casing at 410 feet and is drilling at 486 feet; No. 1 W. B. Roseberry in Section 29-23-9 is arranging to test at 2,715 feet.

ARKANSAS

Ouachita County

Humble Oil & Refining Co. cemented 4½-inch casing at 2,633 feet in No. 4 Murphy, Section 3-16-15, total depth 2,630 feet. Little Fay Oil Co. made location and has derrick up for No. 4 Roberson, 300 feet north and 210 east SW cor. SW NW Section 25-15-16. Standard Oil Co.'s No. 1-B Goodwin, Section 5-16-15, is drilling gummy shale and lime at 2,140 feet.

Union County

Champagnolle—Eddie Jones' No. 3 Crain, Section 2-17-14, cemented off salt water at 3,076 feet and is drilling at 3,275 feet in red shale; No. 4 is bailing to test 3 feet of sand 3,064-67 feet. Ohio Oil Co.'s No. 6 Crain, Section 1-17-14, is waiting orders at 3,031 feet after showing for 200,000 feet of gas in 3 feet of sand. No. 1 H. R. F. Goode, Section 2-17-14, cored a salt water sand 3,070-85 feet and is taking another core directly under; No. 2 Goode is standing with 400 feet of fluid, 50 per cent water, in the hole from 5 feet of sand 3,049-50 feet and is waiting orders; No. 3 Rich Pumphrey, Section 2-17-14, is arranging to make a drill stem test with the bottom one foot in sand at 3,085 feet. Oilwell Corp.'s No. 1 J. Dumas, Section 11-17-14, is drilling at 1,835 feet and No. 1 Townsend, Section 10-17-14, began drilling January 6, set 140 feet of 10-inch casing and is drilling at 1,019 feet. Rushing and others' have derrick up for No. 1 E. E. Gregory 150 feet north and east SW cor. W one-half NW SW Section 11-17-14, 200 feet west of Keen & Woolf's No. 1 Gregory in Section 10-17-14. Timberlake and others' also have derrick up for No. 1 Dumas, 240 feet south and 200 east NW cor. SE NW SW Section 11-17-14.

El Dorado—Morefield and others are rigged up ready to drill No. 1 Hill, Section 7-18-14.

Smackover—Laurel Oil & Gas Co. whipstocked casing at 2,535 feet to get around two joints of drill stem lost in No. 1 Houston, Section 12-16-16 and is drilling at 2,630 feet. Lion Oil & Refining Co.'s No. 1 Leverett, Section 11-16-16, was dry at 1,973 feet and is coring at 1,975 feet; No. 7-B Murphy, Section 8-16-15, is fishing for core barrel head lost at 2,762 feet. C. Murphy cemented the bottom to cut off salt water at 2,770 feet.

EAST TEXAS

Harrison County

J. R. Baham is drilling No. 6 Furrh, James Short Survey, at 600 feet after setting 10-inch casing at 102 feet. Cox and others' made location and have derrick up for No. 1 Furrh in the James Short Survey. State Line Oil & Gas Co. began drilling No. 6 Waterman, a deep test in the E. Pollock Survey, January 8, set 10-inch casing at 135 feet and is drilling at 845 feet.

Panola County

Hines and others' No. 1 Jones in the G. Goodman Survey is shut down in hard lime at 1,797 feet waiting on fuel oil. Magnolia Petroleum Co. cored sandy shale at 2,749 feet in No. 1 Lita Fletcher, in the B. C. Jordan Survey; No. 2 Sol Oden in the E. F. Mitchell Survey was dry at 1,939 feet and will go deeper. The Texas Company has rig up for No. 7-M Adams 660 feet south and west NE cor. Isom Hatcher Survey. D. Thomason and others' No. 3 Crenshaw is a derrick 2,524 feet east and 300 north SW cor. John Womack Survey.

OKLAHOMA FIELDS

(Continued from Page 46)

S Massey, SW cor. SE NW, Section 12-2s-8w, is producing 25 bbls. from sand at 2,068-79 feet.

Seminole County

Magnolia Petroleum Co. made location for No. 5 Rhoades, SW cor. NE SW, Section 12-8-6, Bowlegs Pool. Twin State Oil Co. made location and ordered the rig out for No. 7 Barker, SE cor. NE NE, Section 12-9-5, Earlsboro Pool. The Prairie Oil & Gas Co. has the rig under construction for No. 6 Templeton, NE cor. SW SE, Section 12-8-6, Bowlegs Pool. Gypsy Oil Co.'s No. 1 Henderson, NW cor. NE NE, Section 13-8-6, is being deepened, now drilling at 4,532 feet. W. B. Pine's No. 1 Hoyecha, SE cor. SW SE, Section 26-8-6, is a location. Gypsy Oil Co. is erecting the rig for No. 2 Renton, NE cor. Section 11-7-6, Little River Pool.

Barnsdall Oil Co.'s No. 2 Bruner, SE cor. SW, Section 2-9-5, Earlsboro Pool, had an initial production of 450 bbls. from Wilcox sand at 4,313-22 feet. Magnolia Petroleum Co.'s No. 6 Seay, SW cor. NW SW, Section 12-9-5, was completed for 125 bbls. in Wilcox sand at 4,345-57 feet. Twin State Oil Co.'s No. 2 Barker, NW cor. NE, Section 12-9-5, lost the hole at 3,995 feet and has been abandoned. Sinclair Oil & Gas Co.'s No. 4 Polly, SW cor. NW, Section 3-9-6, Searight Pool, topped the Wilcox sand at 4,682 feet, drilled in to 4,687 feet and made 35 bbls. Independent Oil & Gas Co. and Amerada Petroleum Corp.'s No. 2 Hill, NW cor. NE NE, Section 7-9-8, made 80 bbls after two shots in sand at 3,251-61 feet.

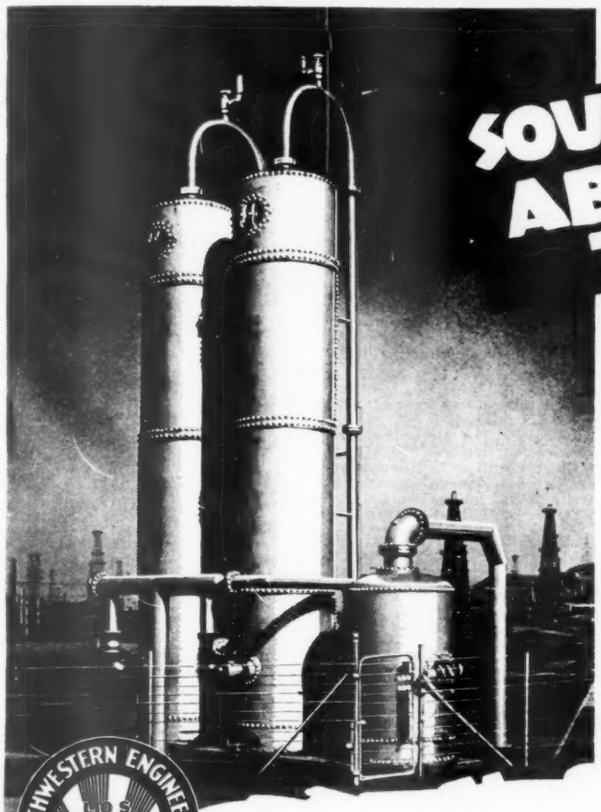
Mid-Continent Petroleum Corp.'s No. 1 Smith, SW cor. Section 12-8-6, Bowlegs Pool, flowed 70 bbls. from Wilcox sand at 4,506-24 feet. Indian Territory Illuminating Oil Co.'s No. 1 Barnett "B," NE cor. SE SE, Section 23-8-6, swabbed 312 bbls. from Wilcox sand at 4,395-4,406 feet. Carter Oil Co.'s No. 2 Fish, SE cor. NW SW, Section 36-8-6, Little River Pool, has been abandoned at 4,237 feet. Magnolia Petroleum Co.'s No. 2 Pottey, SE cor. NE, Section 35-8-6, made 376 bbls. from Wilcox sand at 4,266-76 feet. Amerada Petroleum Corp.'s No. 1 Nitey, NE cor. SE NE, Section 2-7-6, is dry and abandoned at 4,255 feet. Independent Oil & Gas Co. and White Eagle Oil & Refining Co.'s No. 2 Davis, NW cor. SW SE, Section 2-7-6, swabbed 515 bbls. from Wilcox sand at 4,412-18 feet. Mid-Continent Petroleum Corp.'s No. 1 Manuel, NE cor. SE NW, Section 27-6-6, has been abandoned at 4,347 feet. W. R. Ramsey's No. 1 Smith, NW cor. NE SE, Section 8-5-8, Allen Pool, is making 120 bbls. from sand topped at 2,751 feet.

Tulsa County

Holmes and others' No. 1 Ragan, SE cor. NE SE, Section 22-19-10, is spudding. E. D. Davis has the rig up for No. 2-A Perry, NE cor. SE NW, Section 21-19-12.

The Texas Company's No 1 Strip, SW cor. NW SE, Section 10-19-10, an old well deepened, has been abandoned at 2,601 feet in granite. Jackson & Wise's No. 3 Sango, NW cor. SW NE, Section 21-19-12, is making 15 bbls. from the Red Fork sand at 1,536-50 feet. Savoy Oil Co.'s No. 2 Scott, NE cor. SE NE SW,

(Continued on Page 147)



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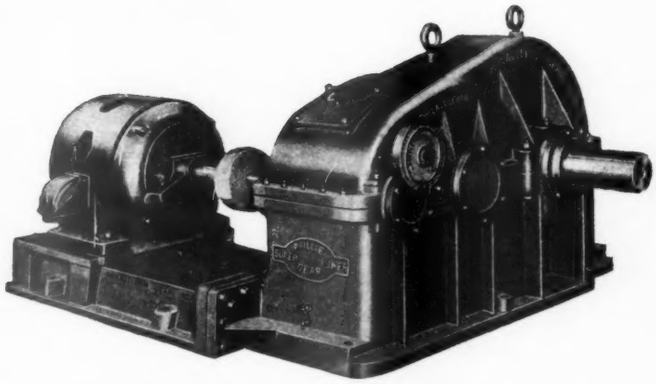

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Listless Demand in Chicago Market

Weather Unfavorable at Opening of Week. Spot Demand for Gasoline Light But Prices Were Unchanged

By J. B. Waldo

CHICAGO, Jan. 16.—There was only a listless demand for actual necessities in the business done today in this market. The weather was unfavorable. The spot demand for gasoline was light but prices were unchanged, the bulk going at 5⅝ to 5¾ cents for U. S. Motor grade. The higher gravities were relatively firm. Kerosene was slow and there was a certain amount of desire to move stocks with some refiners.

The demand for distillates was more active than for kerosene but several sources of supply were seeking orders and the tone was barely steady. The zero gas and fuel oils continue firm but with the present limited consumption of domestic heater oils several refiners have begun to seek future business stating they would be in position to ship in a few days or a week. With the present weather there is little active buying by distributors who are just ordering what they need for early use while waiting for a better demand. There were some inquiries from large users of heavy fuel oils. For the most part these buyers are ordering from month to month. Quite a number of jobbers were in the market looking into the situation and talking over contracts for the coming season. These state that the country roads are very soft but there is a steady traffic on the hard roads.

Little Spot Business

In speaking of the business done in gasoline during the past week, several of the managers of sales for large refiners mentioned that were it not for their contract business the sales would have amounted to very little. It goes without saying that if there had been less contracts there would have been more spot business. Dealers must be supplied in some way and if they did not have contracts they would have to buy as they formerly did. In spite of some obvious objections to the usual marginal contract it has so many advantages for both refiner and dealer that it will hardly be discarded until some more advantageous substitute is found.

U. S. Motor Prices

During last week U. S. Motor gasoline was quite freely offered by refiners at differential points at a price that equaled 5½ cents Group 3. To compete with this price some little gasoline was sold from Group 3 at 5½ cents but this was not the usual asking price. In fact, one large refining organization advanced its price from 6 to 6⅛ cents Group 3 for U. S. Motor gasoline. Several were holding for that price, others for 6 cents. One was asking 6 cents but did take some business on proven competition at 5¾ cents. One exporting company stated that it had been unable at that time to purchase export Motor gasoline at less than 5¾ cents in Group 3 and that with the freight cost this made the price at the export station just about equal to the export price of that grade of gasoline so they could not do business with the Oklahoma refiners so long as the export price remained unchanged at the asking price of 5¾ cents. There was quite a general feeling that the market for U. S. Motor gasoline would be slow until the beginning of March at which time it was thought that the demand from the jobbers would improve and this gravity would have a better show with the approach of warmer weather. More and more it is becoming evident that the motorist is willing to pay for the higher qualities in motor fuel just as he is willing to pay for better qualities in lubricating oils and greases. The wide advertising given by several large refiners of high-grade gasolines has educated the motorist to the fact that there is more than one quality of motor fuels from the same refiner. Many motorists have been prejudiced in favor of some certain refiner's gasoline and those who know the little difference between gasolines run by different refiners to the U. S. Motor specifications, have sometimes wondered and often laughed at the evidences of their prejudice. But when the refiner tells his motoring customers that he now has a better motor fuel, the average motorist will try it once and trying it finds that it is better and being better should be worth more money, so that the demand for the higher tests and the antiknock motor fuels is here to stay.

Better Grades in Demand

When the time comes for increased consumption as it will with the advance of the seasons, the sales of higher gravities and the antiknock gasoline should increase in as great a proportion as the U. S. Motor grade. There may be some motorists who will change back to the standard grade but many sellers voice their belief that with the coming of the new cars and their decreased consumption of motor fuel the demand for the better grade will grow and the proportion of these qualities increase at the continuing expense of the U. S. Motor specifications. The market for the higher gravities and for the special motor fuels has been firm and in some instances a little higher price has been asked. For the 400 endpoint the average price last week was 6½ cents and for the 375 endpoint 7 cents. Natural gasoline was quiet but there was some demand for the A and AA grades and these seemed more firm with other grades unchanged.

Kerosene Dull

Kerosene was dull and the price easy. Some buyers for resale were able to secure a certain quantity at 4 cents they claimed and the market price here reflected a less strong position in the refining centers, as the 41-43 gravity was quite freely offered at 4¼ cents. Refiners with their own distribution are quite generally holding for substantially higher prices. Some are asking 4½ cents and others 4⅜ cents and they state that they are selling as much kerosene as those who are naming a price of 4¼ cents. This is one of their arguments that cutting the price does not increase sales. The larger demand is expected to come early in March when the spring plowing season begins if the weather is favorable.

Furnace Oil Piling Up

All of last week the temperature here was high, much above normal. Practically all of the heavy snowfall has gone and the weather is actually of an April mildness. The demand for furnace oils of all grades and kinds has suffered and stocks are beginning to pile up. There has been some demand for distillate, no rush but a steady filling up movement to dealers chiefly outside of the city as the local distributors receive the bulk of their supplies by contract and they are asking that shipments be held back again. There was no price changes in distillates here and supplies are ample for all present needs. The experiences of the cold spell of the first two or three days of the month are causing the refiners and marketers to hold for full prices as they believe that the next cold spell will last longer and may cause some shortages of furnace oils of the desirable kinds. Distillates would be in line for a good demand from users and might be called for to supply deficiencies in the stocks of other furnace oils such as the straw gas oils which are now selling at the same price as distillates.

Gas Oil Market Strong

The zero gas oil market is strong, particularly for the light colors which have been in steady demand and of which the supply is limited by natural conditions. Blends of oils to produce the color, gravity and cold test wanted have not been satisfactory in many cases, at least there has been a good deal of complaint from distributors on these oils although some are satisfactory. Some of the trouble seems to arise from the blending of oils refined from different crudes. The trouble may be the result of just carelessness or lack of elementary knowledge regarding the mixing of oils to meet a set of specifications. However, if dealers must have light straw gas oil they must pay the price of such a product. Right now although the demand is less insistent than it was earlier in last week, the price is from 3¼ cents up and cars have sold at 3½ cents. Some refiners are holding for that price and it would probably be a common quotation were it not for the quoting of 3¼ cents for straw distillate by several refiners. The bulk of the demand for gas oil for domestic heaters is supplied with the darker gas oil, equally good in all respects as fuel. This is firmly held at 2¾ cents for a good, clean, sweet, dark oil with a low flash and cold test. Some buyers have recently began to ask regarding the endpoint. So far as the forced draft automatic burner is concerned the endpoint is of no consequence. It is considered of some importance in the natural draft burners which are used to some extent in several localities as they want an oil that will burn clean and as the first ignition is from flame the flash is of less importance. Several refiners have considerable supplies of straight run gas oil which they state they are holding for material for their cracking stills when the latter are started in the early spring as they expect now. The demand for the straight run gas oil is only fair at best. One seller of this product has advanced the price for resale to 2⅜ cents and is quoting direct at 2½ cents but orders are still being lost by bidders who quote that price to buyers for the gas companies.

Fuel Oil Stocks Low

It seemed rather peculiar to have a number of the best sources of supply for fuel oil announce last week that they were unable to quote for January delivery as they were sold up for that month. The explanations were various. In one instance it was known that the refineries of the seller were behind on deliveries several days or longer periods but others had been shipping promptly. In one case it was stated that a railroad with whom the refiner had a contract had given shipping instructions that called for all the accumulations of fuel oil held by that refiner. During the cold weather of the first part of last week the refiners did a large business and may have so reduced their stocks that they could not do otherwise than shut off selling for a time. The larger buyers for the larger consumers, however, were not disposed to pay any higher prices. The buyer for one large steel company told a salesman who was trying to secure an order for fuel oil that he would not sign a contract for 18-20 fuel oil over the year at 62½ cents. The buyers for these large concerns are well inforced regarding the large production from the West Texas fields but not as to the quality of the crude or the cost of shipping it to a market. The steel companies are gradually increasing their operations but many of them have contracts and are well behind on deliveries. One of the larger specialty steel companies asked for quotations on 2,000,000 gallons of fuel oil and named the price which it would consider. The buyer for this particular concern is a hard man to deal with and many oil companies will not sell this concern because of the tactics of the purchasing department. The last contract was placed direct with a refiner and on that refiner's specifications, not those of the buyer.

The higher cold test oils are easy in tone so far as can be learned with such a limited demand but the zero oils are steady. Supplies of the former are very large, according to a review of stocks made since January 1 by a large oil company for its own guidance. The general viewpoint of the larger manufacturers is that they expect the first four or five months of the current year to be fairly good—no boom but at least as good as last year but beyond that they are uncertain largely because it is the year for the presidential election.

One of the refiners shipping fuel oil from West Texas crude has written its customers that it will have no more oil for this territory before February. There has been a good many hundred if not thousand cars of this fuel sold through this city to consumers here and nearby and there has been little complaint. The last asking price was 82½ cents, Group 3 basis. Some purchases made direct and shipped through Group 3 from Texas were estimated as costing 80 cents, Group 3. The rates from West Texas points are so badly jumbled that nearly every car received from those points is the occasion for a claim against the railroad for overcharges.

No Change in Lubs

The lubricating oil market has shown no noticeable change. The Texas neutrals are said to be less freely offered at the recent low quotations. The present situation is seasonably quiet. Refiners are receiving some inquiries and report that the prospects for the lubricating business are good but their present activities are not large. The actual consumption is surely fairly large for the season but the actual orders indicate that stocks are being drawn on by distributors. No changes in prices have been reported.

Tank Wagon Unchanged

There was no general change in the tank wagon scale last week. Various reports said to be based on inside information did not materialize—as usual. Gradually the worst spots in the price situation are being smoothed over but there are still several where conditions are bad, so bad that it is hard to see how they could be worse. Indianapolis is one of these spots. Minneapolis is bad but not quite as bad off as Indianapolis. Work is being done at both points but the developments are slow. One report was that all parties to the situation in northern Indiana had agreed to advance the gasoline station price to 17 cents which would still be 2 cents under normal. The tank wagon price was to be 1 cent under the station price. The discount of 1 cent for 50-gallon dumps was to continue which would give the farmer 2 cents below the station price. No change was to be made in the existing Q. D. A. Quite a number of oil men accepted the story but when the tax, freights and discounts are figured it does not look like a permanent basis of settlement. Practically it amounted to a 2-cent cut in the scale.

Down Price Trend in Eastern Market

Despite Favorable Weather, Unhealthy Competition Outweighs Consumption. Gasoline Weakest Feature

By N. O. Fanning

New York Bureau, The Oil and Gas Journal, Room 629, No. 101 Park Avenue, New York, N. Y.

NEW YORK, Jan. 13.—While the decline in crude oil production as reported by The Oil and Gas Journal was responsible for an improved sentiment in refined oil markets here, there was little concrete evidence of improvement in conditions. The demand for gasoline was helped greatly by favorable weather but a continued downward price trend indicated that consumption is still outweighed by unhealthy competition.

A general view of the situation would seem to show that gasoline is at present the weakest feature of the market. Other principal products are steady. Although the Atlantic seaboard is having to absorb more and more imported oil, largely from Venezuela, this is seemingly not adversely affecting the market. Of course, the imports from South American countries are being partly offset by the decline in imports from Mexico.

The oil export situation shows no material change. The movement is holding up well, and while there is a fair amount of inquiry indicating forward business, it is understood that activity in the export field is now centered largely at the Gulf Coast.

Gasoline

Evidence of continued weakness in gasoline during the week was revealed in the reduction in tank wagon and retail prices of a principal brand of gasoline marketed in this territory. This brand, marketed until the last few day at 20 cents, retail, is now available at most stations for 18 cents. The tankwagon price is still nominally 17 cents, but the fact that gasoline is being marketed widely at 18 cents indicates a concession of 1 to 2 cents below the 17-cent level to garages and service stations. It is considered likely that the entrance of a new so-called antiknock gasoline retailing at 18 cents the preceding week has precipitated a condition which may in the end result in a general lowering of the tank wagon structure in New York City and vicinity to 15 or 16 cents a gallon. This would not be surprising when it is pointed out one large chain of stations has been selling gasoline for 13 cents a gallon, retail, for a month.

Gasoline refined from imported crude and imported gasoline are playing an increasingly important part in the eastern market. During the past week a cargo of nearly 2,000,000 gallons of gasoline arrived at New York from Trinidad.

Despite the weakness in the tankwagon situation, refinery gasoline is holding at 8¼ cents, for U. S. Motor, in tank cars. Some marketers see a hopeful sign in the stability of this market. Report that some refiners are holding out for as high as 8½ cents cannot be confirmed, and it is doubtful whether much U. S. Motor gasoline is moving at that figure.

Virginia Gasoline Situation

It is reported that contracts for supplying the State of Virginia highway department with gasoline and lubricating oils for 1928 were awarded by the State Highway Commission. Sinclair Refining Co. was awarded the gasoline contract for construction districts of Bristol, Richmond, Salem, Staunton, Culpepper, Fredericksburg and Suffolk at 17½ cents a gallon. The Power Oil Co. of Lynchburg secured the gasoline contract for Lynchburg at the same price. The Power company was also awarded the contract for supplying all districts of the State with lubricating oil in tank car lots, while the contract for supplying Richmond and Fredericksburg districts with lubricating oil in less than carload lots was awarded to Harwood Brothers of Richmond.

Kerosene Market

The eastern kerosene market continued firm and unchanged. Demand is somewhat smaller, due to warm weather, but this has not caused any weakness that could be noted. Refiners are in an extremely favorable position as regards kerosene and are not inclined to hurry themselves so far as sales are concerned, especially with respect to water white kerosene, for which they anticipate a steadily growing demand.

The furnace oil situation exhibits little change. Although new business is somewhat below expectations, prices are holding steady.

Gas and Fuel Oil

The gas oil situation is said to be in an unusually strong position, although business is somewhat restricted. It is believed that any great volume of new buiness would cause an upturn in prices.

Diesel oil is also firm, with little change in trend.

Bunker fuel oil is somewhat improved. Although one report current is that prices are again being cut by two of the leading refiners, with business done at $1.25 a barrel, or 10 cents below the market, it is also reported reliably that one big factor in the bunker oil market has gone into the open market for material for the first time in many months.

Lubricating Oil

The lubricating oil market continues unchanged and without much special feature. A better demand for steam cylinder oils is reported. Red and pale paraffin oils are quiet. Motor oils are in good demand, but prices continue unchanged. Bright stocks are in liberal supply both from local plants and western Pennsylvania.

Texas oils continue weak and are in liberal supply. The demand for them here is somewhat limited, however. Reports of curtailment in the Gulf Coast have cheered the trade somewhat.

Paraffin Wax

The paraffin wax market is firm. Prices continue low, but a steadily increasing amount of business is reported from domestic sources. The export movement is helping maintain a good tone in the domestic price situation.

Petrolatum

Petrolatums are firm. Prices are unchanged. Dark green is in better demand at 1⅞ cents a pound. Amber is also being sought on a bigger scale. Snow white and lily white, although in somewhat less demand, are maintaining their price levels.

The Export Market

The oil export market shows no material change from last week. The foreign markets may be described as undergoing a building-up process, in which consumption is growing in many directions, while prices are held down by competition and overproduction. Prices around the first of the year are extremely low in most instances, with no immediate prospect of improvement.

The outlook in most oil fields of the world is for increased production during 1928, and this outlook is serving to restrict enthusiasm all along the line, from the fields to markets.

The most promising feature of the export situation here is the continued good demand for oil from South America. There is steady expansion in shipments in cases, with occasionally a bulk cargo. For instance, more than 1,000,000 gallons of gasoline were shipped in cases to Brazil during the past week, in addition to over 900,000 gallons of kerosene. Chile, which has been a small customer of the New York exporters, is constantly increasing the size of its orders for lubricating oil and greases. Where orders used to average 150 to 300 bbls. each, they now go up as high as 500 bbls. each.

While the demand for gasoline and kerosene in bulk is only moderate, plans are being laid in Europe for extension of motor vehicle tranportation and aviation. In the latter field, for instance, six American banks doing an international business have provided $500,000 to finance an elaborate attempt to establish American airplanes in foreign markets, in connection with the Curtiss Aeroplane Export Corp. C. M. Keyes, president of the Curtiss company, states that the gradual consumption of surplus war airplane stocks has made it possible for American manufacturers to enter the foreign airplane field. Great Britain, France and Italy now lead, although American interests have given them competition. The Curtiss interests plan to enter other European countries and also Japan. The export company has represented the parent airplane company for 10 years in South America.

The paraffin wax export market continues favorable, with shipments of crude and refined the past week amounting to 1,114,460 pounds, of which crude scale represented 662,360 pounds. There is at present an especially good demand for crude wax in Sweden and England.

The following table shows principal exports of petroleum and petroleum products from New York during the last three weeks; (all figures in gallons unless otherwise noted):

	Jan. 11	Jan. 4	Dec. 28
Gasoline:			
Bulk	.....	1,948,800	3,735,657
Cases	1,334,000	430,990	221,250
Kerosene:			
Bulk	.....	357,000	1,470,000
Cases	3,339,770	555,500	931,200
Lubricating oil:			
Bulk	.....	3,301,887	.....
Barrels	1,206,700	572,150	808,100
Cases	80,970	142,250	95,080
Lubricating grease:			
Barrels (lbs.)	386,100	.....	531,900
Parrafin wax:			
Bags (lbs.)	452,100	110,000	1,537,360
Barrels (lbs.)	662,360	99,750	208,050
Petroleum asphalt:			
Barrels (tons)	559	3,418	185

The foregoing figures include all shipments of 500 bbls., 1,000 cases, or over.

Tanker Market and Movement

There is a much bigger demand for oil tankers, and the number of fixtures during the past week indicates a broad demand for vessels for all trades, but at low rates. There is talk of expansion in the California-Atlantic Coast movement, but inactivity in that route is restricted at present. The export routes and South American routes are the feature.

A fixture for a number of consecutive trips from the Gulf to north of Hatteras at a minimum of 17½ cents or maximum of 26½ cents a barrel would seem to measure the present outlook for the market over the next six months. The present rate is 17½ cents, but as this is claimed to be below the cost of operation of the vessels, it is not believed business will continue long at this low rate. The charterers of the above vessels apparently had in mind a possible rise in the tanker market when they agreed to 26½ cents as the top rate, in the event of an advance.

New fixtures include the following:

Tanker Agwihavre, Curacao to United Kingdom-Continent, January loading, 14s 6d.

Tanker Dannedaike, Gulf to Continent, lubricating oil, prompt loading, 17s.

Tanker Ida Knudsen, 12,800 tons, Gulf to United Kingdom-Continent, continuation 6 months, crude oil, 7s.

Tanker Rosario, 8,700 tons, January, route unnamed, 5s, 12 months continuation.

Tanker Neptune, 9,000 tons net, clean, January to United Kingdom-Continent, 13s from north Atlantic, 15s 6d from Gulf, 14s from Curacao.

Tanker Ellsworth, 7,800 tons, clean, to two French Mediterranean ports, from North Atlantic, 16s 6d, Gulf 18s 6d, January loading.

Tanker Hampton Roads, Gulf to north of Hatteras, prompt loading, 19 cents, two Gulf ports.

Tanker Cecil County, Gulf to north of Hatteras, prompt delivery, consecutive trips, not less than 17½ cents or more than 26½ cents, according to market rates at loading time, with usual arbitration clause.

Tanker Julius Schindler, Gulf to Rouen, lubricating oil, January loading, 24s.

Tanker Louisiana, 3,500 tons, Black Sea to French Mediterranean, February loading, 14s 6d.

Tanker British Lantern, California to United Kingdom-Continent, gas oil, January loading, 28s.

Tanker Luciline, 4,800 tons, Constanza to United Kingdom-Continent, clean, end of January loading, 16s 6d.

Tanker Deodata, 3,500 tons, Constanza to Alexandria, clean, prompt loading, 12s.

Tanker Aral, 3,500 tons, Black Sea to south of Spain, 14s, Black Sea-Santander, 17s 6d, January loading.

A record winter movement of oil by tanker to the Atlantic Seaboard took place during the week ended January 11, when total receipts of crude and refined aggregated 5,360,000 bbls., an average of 766,000 bbls. a day. This was due in turn to record imports from South America, amounting to 1,566,000 bbls., or 224,000 bbls. a day, and partly to a heavy movement from Gulf ports. The latter amounted to 3,093,000 bbls. or 442,000 bbls. daily.

Another record was established in the movement for the week ended January 11 when over 1,000,000 bbls. of crude and refined oil were imported from South America into the port of New York alone. Contributions to this import movement were made by Venezuela, Colombia and Trinidad.

The total receipts at New York harbor for the week were 2,650,000 bbls., or 379,000 bbls. a day. Of the total, 1,325,000 bbls. came from the Gulf Coast, 306,000 bbls. from the Pacific Coast, and 1,019,000 bbls. from South America. No oil was imported from Mexico into New York during the week.

Imports from Mexico totaled 216,000 bbls., or 31,000 bbls. daily.

The following table shows estimated daily average receipts of crude and refined oil by water at Atlantic Coast ports for the past three weeks; also monthly record for the past 12 months (figures in barrels):

	Week Ended		
	Jan. 11	Jan. 4	Dec. 28
Gulf Coast	442,000	332,000	360,000
Pacific Coast	69,000	25,000	91,000
South America	224,000	113,000	113,000
Mexico	31,000	56,000	49,000
Total	766,000	526,000	613,000

Daily Averages by Months					
1927:	Gulf	Pacific	S. Am.	Mexico	Total
Dec.	345,000	68,000	146,000	37,000	596,000
Nov.	318,000	62,000	109,000	42,000	531,000
Oct.	314,000	98,000	91,000	38,000	541,000
Sept.	336,000	97,000	99,000	69,000	601,000
Aug.	397,000	90,000	78,000	80,000	645,000
July	406,000	83,000	49,000	78,000	616,000
June	378,000	118,000	47,000	68,000	611,000
May	332,000	58,000	53,000	91,000	534,000
Apr.	388,000	93,000	61,000	69,000	611,000
Mar.	345,000	103,000	81,000	36,000	565,000
Feb.	379,000	89,000	48,000	40,000	556,000
Jan.	362,000	73,000	61,000	49,000	545,000

The foregoing figures are based on the carrying capacity of incoming oil-laden tankers.

Cost Accounting in Plant Operation

Explains Method in Use at Texas & Pacific Refinery Covering Skimming, Cracking and Lubricating Departments

By J. Von Carlowitz and J. A. Gerhard*
Plant Engineer, Texas Pacific Coal & Oil Co.

It is the desire to set forth as simply as possible an outline of the cost accounting procedure in use at the Texas Pacific Coal & Oil Co.'s refinery No. 2, Fort Worth. This procedure was arrived at to suit the needs of the refining and executive departments, and is not based on any definite method of cost accounting. Some facts set forth are open to criticism, and there is no doubt that some minor changes will be made from time to time as the operation of the plant changes. The objects of the cost system were; first, to analyze manufacturing expense in our processes, with the idea of eliminating as much expense as possible; second, to secure costs to base future operations on; and third, as an outcome of both, to determine which products are most profitable to manufacture.

For the sake of clearness a brief outline of the refining operation is as follows:

1. Skimming Department—Light oil treating such as gasoline, kerosene, etc.
2. Cross Cracking Unit—Vapor phase treating.
3. Vapor recovery unit.
4. Ethylizing unit.
5. Lubricating plant, subdivided as follows: (a) Treating long residuum; (b) mixing prepared palex pulp (clay) with acid treated long residuum; (c) Foster heater for neutralizing clay oil mixture; (d) blending clay oil with naphtha; (e) contact filtering; (f) additional blending of filtered stock with naphtha; (g) chilling; (h) centrifuging chilled oil into—(aa) wax-free oil solution. (bb) Petrolatum solution. (i) Reducing wax free oil solution for—(aa) Recovery of naphtha. (bb) Unfinished neutrals. (cc) Bright stocks. (j) Reducing unfinished neutrals for—(aa) 100 viscosity distillate. (bb) Finished neutral (k) Brightening stocks and neutrals.
6. Compounding and Grease Plant—(a) Manufacture of greases, blending of various motor and industrial oils.
7. Auxiliary Plant Units—(a) Clay manufacturing plant; (b) refrigerating plant; (c) fuel system for both fuel oil and gas; (d) machine shop; (e) water system; (f) boiler house; (g) electric power; (h) general pumping system; (i) slop recovery; (j) weak acid recovery.
8. Plant or Works Overhead—(a) Research and control laboratory; (b) general plant repairs and miscellaneous operating expense; (c) general plant and office overhead which consists of—(aa) Superintendents and executives salaries; (bb) salaries of clerks; (cc) plant office supplies; (dd) lights, heat and water used for administrative department; (ee) insurance; (ff) taxes; (gg) engineering salaries and expense; (hh) store house salaries and material handling expense; (ii) tank car loading expense; (jj) miscellaneous overhead; (kk) automobile and trucking expense.
9. Plant Depreciation—It was determined that the accounting system should; first, follow the plant operations as closely as possible; second, to be conducted and handled as inexpensively and simply as possible; third, that figures be available for executive department at earliest possible date.

Mechanical Order System

With the idea of securing the above results, it was apparent that a work order, or mechanical order system, should be installed for the purpose of obtaining uniform distribution of labor and material cost, and repairs and maintenance. Accordingly, the plant was divided into an operating and mechanical division, all these employes being carried on daily payroll. As a preparatory measure for the mechanical order system, to eliminate expense, and to simplify time distribution, white labor tickets for operating men and yellow tickets for the mechanical or maintenance men, were given to the various foremen.

The mechanical order system used was similar to that used in other refineries. Preliminary requests for repairs or other work originate with various foremen, both operating and mechanical, and these request are written on a form for that purpose and sent to the superintendent for approval. If this request is considered necessary by the superintendent he approves same, classifying the work as "rush," "prompt," "next week" or other designations. The approved request is passed to the plant engineer who rewrites and numbers the order, making sufficient copies for the foremen and subforemen in charge of the work.

Each day a summary of mechanical orders is issued stating the mechanical order or job number, the account chargeable, and a brief description of the work. Material withdrawn from the warehouse is requested for M. O. 10 as the case may be. The warehouse tickets are accordingly made out, charging M. O. 10 for the material. These warehouse tickets are forwarded to the storehouse accountant who makes a detail of the various accounts, showing the nature of the material and equipment and the values issued from the warehouse. At the completion of a day's work the labor foreman turns in the yellow time slips for the mechanical men, putting down a brief description of the work and the mechanical order number.

The timekeeper receives these tickets and posts the repair charges to the maintenance account for the various operating and auxiliary units. The white labor tickets for the operating men are simply marked by the foremen as "crude stills", "rerun stills" or whatever unit the men are engaged in, and are then distributed to the various operating accounts by the timekeeper. In this manner all material and labor is correctly charged to the proper account, and at the end of periods summaries are made by the storehouse accountant giving detailed material cost, and by the timekeeper for detailed labor cost.

To prevent charging of material to various units, and lumping charges on chemical and other items, to the operation at intervals, it was decided to clear all items through our warehouse ledgers, except miscellaneous supplies for the laboratory, office, etc. All chemicals such as caustic soda, soda ash, litharge, sulphur, clay, etc., were carried as a part of the warehouse department and the actual amounts used by the operating department were cleared periodically.

Expense Division

Each operating unit and auxiliary unit at the refinery has generally the following divisions for expense: (1) Operating labor; (2) supplies and expense; (3) repairs and maintenance; (4) fuel; (5) water; (6) steam; (7) electric power; (8) transfer pumping; (9) chemicals; (10) clay.

A brief description of the different subs follows:

Operating Labor—The wages of the men necessary to the operation of this particular unit are applied against this account.

Supplies and Expense—Against this account are applied such items as lub oil, waste, small tools, etc., necessary to operation of unit.

Repairs and Maintenance—All labor and material used for repairs and maintenance of units go into this account.

Fuel—This account includes both fuel oil and gas burned at units. Fuel oil is distributed on basis of percentages furnished by engineering department, while gas is metered at each unit.

Water—This is distributed on a percentage basis furnished by the engineering department, all charges to water system being rated to different units.

Steam—This is also worked out on a percentage basis and distributed from the auxiliary account "boiler station"—this being source of steam supply for entire plant.

Power—The charges to this account originate from auxiliary account "power purchased" from outside source and also such expense and labor necessary for the operation of transformers, being distributed to various units on a percentage bais.

Transfer Pumping—Charges to this sub originate from auxiliary account "transfer pumping"—being distributed on percentage basis to proper units.

Chemicals—To this sub is charged all chemicals used in different manufacturing units.

Clay—To this sub is charged all clay used in different manufacturing units.

Auxiliary Accounts

Above we have referred to auxiliary accounts prorated on percentage basis. There are some auxiliary accounts not yet mentioned such as:

Treated Clay Manufacturing Plant—This account is cleared in total to direct operating account "contact plant mixing." The cost of manufacturing treated clay is figured on actual tons produced against expenses. The current inventory is priced at cost for current period.

Refrigerating Plant—This account is cleared in total to direct operating account "Sharples plant chilling."

Machine Shop—This account is cleared on a percentage basis, based on amount of time spent by shop crew on different units.

Acid Recovery System—No operating labor has as yet been charged to this account as the time spent by men at agitators on this system is negligible. Eventually there will be repairs and maintenance charges to this unit. This unit is operated on a nonprofit basis, therefore, any saving realized by the operation is applied against the entire plant.

Laboratory—The expense of operating this unit is prorated over the direct operating units on basis of per cent furnished by chief chemist.

General Plant Repairs and Maintenance—The expense charged to this account is cleared to direct operating accounts on money basis or the ratio the total "general plant repairs and maintenance" bears to the total direct operating charges. This method of prorating this account will perhaps cause some criticism but I believe that it is a very practical, as well as a fair way of prorating this expense.

General Expense—This account is also cleared to direct operating accounts on a money or ratio basis, as it is logical that the unit with the greatest operating and maintenance expense requires a greater proration of superintendence, etc., than a unit with less expense.

Automobile and Truck Expense—Into this account is charged all expense incident to operating all cars and trucks. A record is kept on each car and truck so that we may know what it costs to operate different equipment. This account is cleared to different operating units each accounting period. The charges are arrived at by taking truck

*Paper read at meeting of refinery employes, Texas Pacific Coal & Oil Co.

PROPER CARE OF REFINERY PUMPS PAYS BIG DIVIDENDS TO COMPANY

By R. Beattie*
Plant Engineer, Texas Pacific Coal & Oil Co.

Why does ill treatment cut down the life of a pump? How can such conditions be remedied to the advantage of the employe, and the employer?

For example, let us take the most common piece of equipment in a refinery, the machine that gets the roughest use and abuse, the machine that runs until something lets go. I am referring to the much abused duplex steam pump.

To start with the pump cold and follow through the pumping and shutdown, reveals at almost every turn a point at which the pump is abused. For example, lubrication is seldom thought of while starting. Generally the operator starts the pump and then starts the lubricator, if he remembers to. Perhaps the pump has been standing two or three days. If such is the case the chances are there is a thin film of rust in the cylinder. This is when the pump needs lubrication, at the first few strokes. Then again, consider the fact that the cylinders are full of water and cold. It is very easy to forget these all-important drains and start with them closed. But consider what might happen. When this water is left in the cylinder and expelled through the exhaust port you are changing the temperature suddenly from around atmospheric to steam temperatures. One of the inherent weakness of a cast iron casting is its inability to withstand sudden temperature changes. You are taking a chance of breaking a cylinder casting. Again, starting in this condition (i. e. with drains closed and water in the cylinder) a sudden slamming on one stroke brings the steam piston up against the water in the cylinder, the water is incompressible and something has to give. Generally it is the cylinder head, and I have seen cases that resulted in additional damage to rods and liquid end castings.

After the pump is warmed up and started, if running with the suction valve closed, much damage can be done by a sudden opening of the suction valve. You would not run your automobile engine fast and suddenly snap in the cluth. The principle is the same in the pump. You are applying load by opening the suction valve. A sudden opening may mean dislodged valve seats, or other serious complications.

Loss of Suction

Another common source of breakdown is that resulting from loss of suction. Especially in tank transfers, where one tank is being pumped out and is pumped dry. Load is suddenly released from the pump and it runs away, before someone shuts it down. It may sustain numerous sprains, scratches, cuts and internal injuries. The same damage may be sustained by overspeeding the duplex pump.

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*Paper read at meeting of refinery employes of The Texas Pacific Coal & Oil Co.

reports, turned in by truck foreman daily, which show time spent by truck on each job during the day. These reports are summarized and a distribution of charges made to proper accounts.

Plant Depreciation—The depreciation is based on the actual life of equipment as compiled by the engineering department. This is prorated over the direct operating units on basis of amount of investment carried on each unit.

Pricing Inventories

The method of pricing inventories of stocks has caused considerable discussion, and several means have been tried. The system finally worked out has proved very satisfactory, and is as follows:

The finished stocks, that is, the products up to market specifications are priced each month at the current market price of the products. The unfinished, or intermediate products, are priced at actual cost as compiled on different operations.

The foundation of this method of computing costs on intermediate products is —pricing crude into stills at average market price, adding operating expense of crude stills to cost of crude, then pricing your byproducts yielded at current market price less cost of treating. This leaves the balance of cost to fall on unfinished long residuum the product primarily run for. The price thus secured on the unfinished long residuum is used in transferring this product into the agitators, where the operating expense is added to the cost of the unfinished long residuum to arrive at a price on the treated long residuum.

This method of charging the products into each manufacturing operation at cost, and adding the cost of operating the unit to cost of product charged to secure cost of products yielded, is continued on through the contact plant and sharples plant operations until the price of wax free oil is arrived at. This price is used to transfer wax free oil into rerun stills, where operating expense is added, thus giving total cost of products yielded from rerun stills. Such byproducts as can be are priced at current market value, and the price of primary products, such as unfinished neutral and stock, is compiled on relative sales of neutral and stock produced. The cost price on unfinished neutral and stock can be arrived at by a different method, but the relative sales value theory is considered to show more accurately the cost of these products.

Cracking Operation

The cost of products from Cross cracking unit is arrived at as follows: The gas oil is charged to the unit at the inventory value of cracking stock and the operating expense of unit is added. This gives a total cost of products yielded. The byproducts are priced at current market value, leaving the balance of cost to fall on gasoline distillate—the primary product.

In ethylizing cracked gasoline, the cracked gasoline is charged in at cost price of finished gasoline from the cracking unit; to this is added cost of ethyl fluid, dye, etc., used, giving your total cost of ethyl gasoline made.

The co-operation of the operating department with the accounting department is a necessity for accurate reports of all kinds. This point cannot be stressed too strongly as the accounting department is absolutely dependent on the operating department for the information on which to base its figures. The continued close co-operation between these departments will make a smooth running and efficient organization.

CARE OF REFINERY PUMPS PAYS BIG DIVIDENDS

(Continued from Page 138)

It doesn't seem to be common knowledge but every duplex pump has a definite rated speed over which it should not be run. The general practice seems to be to run them as fast as they will go. Speeding means overstroking which is payable in terms of new rods, new heads and sometimes new pumps. This practice and the previous condition, i. e. loss of suction accounts for more damage to duplex pumps than anything else. If these could be eliminated our pump repair costs would take a startling drop.

Another source of constant experiences is the question of piston rods. Perhaps the outstanding causes of piston rod wear, are lack of lubrication, improper adjustment of glands and the use of packing unsuited to the service. In the packing of gasoline and other nonlubricating products, a swabbing of the rods with steam cylinder oils, is to be recommended. In all duplex pumps lubrication of the steam rods should be taken care of by outside swabbing, not depending on the cylinder lubrication at all. You can make surprising savings on packing costs by doing this.

Maladjustment of the two-hole type stuffing box will score piston rods beyond repair, in three or four strokes. Sound rods mean in turn loss by leaks and extra packing costs.

We could go on indefinitely, and point out causes of repairs, and replacements on the steam duplex pump. Perhaps 1 per cent of the troubles can be blamed on the pump manufacturer, the rest of the sin is on our shoulders.

Three Classes

I have listed three points under which all of the above abuses can be classed.

1. Carelessness on the part of the operator.
2. Ignorance on the part of the operator.
3. Lack of proper lubrication.

Let us consider them in order.

Carelessness

A hundred panaceas can be offered to meet the common enemy to industry—carelessness. It takes toll in human life, health, happinss and dollars. It seems to me however, that the one sure way to combat the evil is to work on the source, the man's interest in his job. A careless man is a disinterested man. Drastic measures such as dismissals and layoffs have in most cases the desired effect but arouse in some cases an antagonism that offsets results. I should suggest trying to arouse the man's interest. If he is not satisfied, transfer him if possible and place him where he is satisfied. Point out to him that how he meets his responsibility is the company's measure of his success. Point out to him that the management is interested not only in results but in efficient results, and that efficient results are impossible with high maintenance repair costs. Point out to him that it is his job to keep the equipment working efficiently and smoothly, just as it is your job to keep him working efficiently and smoothly. And last but not least if he is chronically careless and incurable fire him, for nothing in a refinery, is such a potential liability as a careless man.

Ignorance of Operator

Ignorance is much more easily combated that carelessness. Ignorance can, however, be charged with a lot of the repair costs. Such points as knowledge of rated speed, rated capacity, etc., can easily increase the life of a pump. Operators are essentially operators, and not mechanics. By a closer co-operation between the foreman of the operating and mechanical departments, much can be done towards decreasing repair costs. For example an operator may run a compressor excellently well and still not be able to recognize a loose crank bearing. In ignorance, he might run the compressor an hour while waiting for a mechanic, and take the chance of seriously damaging the machine.

If he was trained as he should be, when any strange noise develops he would shut the compressor down immediately. Another example is well shown in the matter of packing. A mechanic knows how hard a gland should be pulled up to stop leakage. Beyond this point new packing is needed. An operator might not know and pull up too hard, which results in scored rods or increased friction load. Again ignorance as to the proper amount of lubrication would result in over lubrication with its waste, or under lubrication with its excessive wear.

Lack of Lubrication

Lack of lubrication contributes much to our repair costs. It can be charged to either of the foregoing, i. e. carelessness or ignorance. When you consider the part played by the lubrication and go into the details it can be shown that in power consumed alone it is possible to effect a saving of from 10 to 12 per cent. In considering the wear on the duplex pump, remember that the average speed is about 60 strokes per minute. This means every part moves 120 times per minute. With no oil on the rocker arm stand, for example, it does not take long to wear a bearing beyond use.

I would like to diverge a moment here and stress the importance of this point on electric machinery. As you know, motors are generally high speed. There are only two bearings to oil and failure in either one of these bearings is bound to do electrical damage as well as mechanical damage. What happens is that the rotor drops down and drags on the stator causing excessive heat and consequent damage to the winding. This is a concrete example of the far-reaching effects of lack of lubrication.

Overlubrication in a motor leaves an oil-covered surface where dust, grit and dirt collect leaving a messy dirty scum on the end frame which in time is liable to get into the bearing.

Many points could be abused in the operation of centrifugal triplex and rotary pumps. Without going into minute detail, let us consider the major difference in these two types. The centrifugal pump is not a positive displacement type and the discharge can be throttled and even closed with safety. The rotary pump is positive pressure and if not equipped with relief valves will build up a fracturing pressure with discharge valve closed. These two features should be given the closest attention by the operator. Generally speaking, the centrifugal pump is high speed, and lack of lubrication means damage more extensive than bearing trouble, broken impellors and cracked casings often being the result.

To generalize safety devices such as governors, relief valves and speed regulators for mechanical equipment, and fuses, overload relays and no voltage devices for motors are being more and more extensively applied to the industry. However the operator should always bear in mind that none of these devices are foolproof and become effective only with the co-operation care and attention of the operator. Treat these devices with the respect due their station; never attempt to overload or speed up the equipment by manipulation of these devices because they are invariably set for safe operation.

In closing I would be satisfied if I have succeeded in driving home this one point, namely, that upon the general attitude of the employe towards the equipment in his care, depends the life and usefulness of the machine. To ill treat and abuse this equipment inevitably reflects on the operator directly.

ROCKY MOUNTAIN AREA

(Continued from Page 131)

the hard lime which has given so much trouble, and is drilling at 972 feet in blue sandy shale. Midwest Exploration Co.'s No. 1 Early, Section 13-14-6, Duchesne Dome, is cleaning out and reaming at 2,840 feet, only 30 feet off old bottom reached 4 years ago, and new hole probably will be made within a few days. Same company's No. 3 Ashley Creek, Section 23-5-22, in Uintah County, is redrilling at 1,450 feet. The Diamond Oil Co.'s No. 3, Section 29-8-3, Buskirk Dome, Utah County, is setting 12½-inch casing at 135 feet.

Montana

The California Petroleum Co. will drill several wildcat structures in Montana the coming season besides developing its holdings in the Sunburst Field. In Wyoming it has a large portion of the production from the LaBarge Field and the Midwest Refining Co. has guaranteed a pipe line from that field this spring.

A well is being started in Phillips County, northern Montana, near the town of Saco, on a wildcat structure and the operators expect to find a gas supply around 1,500 feet.

Sunburst Field has produced the high light of the winter in the No Jack Oil Co.'s No. 1, on Section 27-35-3, which found a sand at 1,660 feet and is estimated at 5,000 bbls. daily. It is beaned down to about 1,000 bbls. daily.

The well will likely start an entirely new development in Sunburst for the location is west of all development and in an area given up as worthless. The well is west of the railroad that runs up the west side of Sunburst Field and the railroad has long been considered the dividing line between good and bad territory, that on the west side being considered worthless, while the east side was developed. Dry holes are scattered over the area.

Just what sand the well has found is not certain, some say it is the Ellis sand while others claim it to be a stray sand and entirely separate from the producing horizons in the field proper. Until the hole is drilled into the Madison lime, this question cannot be settled.

The city of Shelby has lost the case to prevent the transportation of nitroglycerin through the streets.

ROCKY MOUNTAIN PRODUCTION
Runs From the Field

Wyoming	
Salt Creek	42,300
Big Muddy	2,670
Grass Creek	2,480
Elk Basin	870
Greybull	20
Dutton Creek	10
Rock River	3,570
Lance Creek	650
LaBarge	630
Mule Creek	650
Poison Spider	140
Hamilton	610
Osage	390
Lander	890
Ferris	50
Byron	40
Lost Soldier	2,730
Simpson Ridge	80
Total Wyoming	57,780
Montana	
Cat Creek	1,820
Lake Basin	170
Kevin-Sunburst	9,000
Total Montana	10,990
Colorado	
Florence	878
Moffat	1,096
Fort Collins	2,992
Iles Dome	1,320
Rangely	100
Tow Creek	512
Boulder	25
Total Colorado	6,923
New Mexico	
Rattlesnake	230
Hogback	640
Cap Rock	109
Table Mesa	...
Artesia	1,452
Total New Mexico	2,431
Total Rocky Mountain	78,124

TEXAS DRILLING RULE TO U. S. SUPREME COURT

AUSTIN, Tex., Jan. 14.—The Attorney General's Department has been advised that the United States Circuit Court of Appeals at New Orleans, La., overruled without opinion the motion for rehearing in the case of Oxford Oil Co. and others' vs. Atlantic Oil Producing Co. and others' in which the court on a former day entirely upheld the validity of the Texas statute empowering the Railroad Commission to make rules for the conservation of the oil and gas of the state and also sustaining the rules as reasonable.

The oil company will appeal to the Supreme Court of the United States on a writ of certiorari.

Plaintiff claimed the rule which prohibits the drilling of an oil test within 150 feet of another or within 600 feet of a neighboring "property line" is invalid and cost it millions.

PENNSYLVANIA MARKET

OIL CITY, Pa., Jan. 14.—In the Pennsylvania refinery district, gasoline and naphtha were moving fairly well with no changes in price. Actual consumption was also good as the weather was fine during the week. Kerosene and fuel oil were in good demand. Bright stocks were fair. Cylinder stocks were slower and weak. Neutrals were unchanged. Wax was in good demand and firmer in price.

REFINING AND MARKETING

ASSOCIATED HOLDS FOUR-DAY ANNUAL CONVENTION

SAN FRANCISCO, Calif., Jan. 14.—The first sales convention of the Associated Oil Co. for 1928 was held here this week at the company headquarters. The convention was attended by the district managers, sales supervisors, industrial salesmen and lubricating engineers stationed in California and Nevada. A similar convention for the northwest sales area of the company will be held next week at Portland, Ore.

The four-day convention of the past week was spent in discussing the company's sales plans for the coming year. Several officials and departmental heads addressed the convention on the various phases of the company's activities. The salesmen visited the company's refinery at Avon where those in charge explained the refining processes used in the manufacture of Associated's products. A banquet and theater party were among the entertainment features.

The following were in charge of the convention: F. M. Rowles, general chairman; B. E. Allen, vice chairman; J. H. Lewis, program; J. F. Johnston, refinery program; G. W. Hastings, transportation; Walter Brunn, housing; Samuel Kadlecik, finance; C. V. Gay, reception; E. L. Lomax, publicity; H. R. Deal, entertainment and banquet and C. L. Harper, decoration.

PURE OIL CO. REPORTS DETONOX INCREASING

CHICAGO, Jan. 14.—The sales department of the Pure Oil Co. reports a very satisfactory increase in its Detonox gasoline. This gasoline which was first introduced to the trade in November, 1926, has been improved with the view of giving the motorist maximum service. Changes made in processing at the company's refineries have made it possible to give those specifications now considered desirable in gasoline. High antiknock properties, prompt starting, quick acceleration and minimum of carbon are claimed for the gasoline.

WANT SHARE OF GASOLINE TAX

CHICAGO, Jan. 14.—The heads of Chicago suburbs have decided to circulate a petition in the 42 Chicago suburbs asking that they be given a share in the state gasoline tax. It was stated there were 500,000 voters in these suburbs and that it would be easy to secure 250,000 signatures to a petition of this nature.

STANDARD OF CALIFORNIA ENTERS MID-CONTINENT WITH REFINERY

The Standard Oil Co. of California will become a factor in Mid-Continent refining and marketing, according to an announcement of the past week.

Officials of the company on Monday confirmed the report from El Paso that the company under the name of the Pasotex Petroleum Co. will build a refinery at that point. The company has purchased a 125-acre site 2 miles east of El Paso and will build a 10,000-bbl. skimming plant. The cost, including site, will be approximately $750,000.

The plant will operate on crude oil from West Texas fields. The company owns considerable production in several pools of that area with large undeveloped holdings. Construction work will start immediately and it is expected that the plant will be ready to operate within five or six months. The crude oil at first will be brought to the refinery by tank car. Officials stated that eventually a pipe line connection to the field will be built.

The building of the refinery is the California Standard's first move to extend its refining and marketing facilities east of the western states and is additional evidence of a general development in which several of the Standard companies are overlapping in the expansion of their market outlets. The California company in the past has not had any refineries except on the Pacific Coast and its direct market outlets have been confined to the west coast states and Arizona and Nevada.

The building of the El Paso refinery will no doubt necessitate a further expansion of its marketing facilities in the western part of Texas and New Mexico and probably other southwestern points. The El Paso refinery will be especially well located for distribution in west Texas and New Mexico and part of Arizona. A plant handling 10,000 bbls. of crude oil daily will have gasoline, kerosene and other products in excess of the requirements of nearby consuming points and this situation no doubt will result in the Standard company being a factor in the Mid-Continent domestic and export tank car markets.

The Standard Oil Co. of California for the past two years has been interested with the Anderson-Prichard Oil Corp. of Oklahoma City in the refinery of the Col-Tex Refining Co. at Colorado, Tex. The Standard company has crude production which is furnished the refinery and is part owner of the plant. The management of the refinery, including marketing, is in the hands of the Anderson-Prichard Corp.

TERMINAL LOADING RACK FOR HENDRICKS CRUDE

MIDLAND, Tex., Jan. 14.—Landreth Production Corp., Fort Worth, Tex., is completing a 30-car loading rack in Section 41, Block A, Ward County, and on the T. & P. railroad. The rack will be the terminal for a 6-inch line running south from the Hendricks Field in Winkler County. Landreth Corp. has a 1,000,000 bbl. crude contract with the New Orleans Refining Co., which is to be filled between April 1 and August 1. The Independent Oil & Gas Co. is running oil through its Hendricks line to a 75-car loading rack. That company has a 5,000,000-bbl. crude contract with the New Orleans Refining Co.

START GASOLINE PLANT

The Empire Gasoline Co. this week will start operating a natural gasoline plant at Wichita, Kans. The plant, which is of the oil absorption type, will secure its gas from the main gas line of the Cities Service Gas Co., which furnishes dry gas to Wichita and other Kansas points.

NEW ASSOCIATION OFFICERS

H. L. Eggleston of the Pan American Petroleum has been elected vice president of the California Natural Gasoline Association. H. R. Linhoff of the Richfield Oil Co. and John N. Hicks were elected to the executive committee, and two vacancies in the board of directors were filled by E. L. Tobias of the Bankline Oil Co. and W. P. Smith of the Wilshire.

OPENS CHICAGO OFFICE

CHICAGO, Jan. 14.—The New Orleans Refining Co., Ltd., has opened an office on the fifteenth floor of the building at 624 South Michigan Avenue, which is largely occupied by oil offices. The products to be sold are chiefly asphalt and road oils.

NEW ABSORPTION PLANT BUILT AT MAGENTA, LA.

SHREVEPORT, La., Jan. 14.—Natural Gas & Fuel Corp., of El Dorado, Ark., has completed and put in operation an absorption gasoline plant at Magenta, 6 miles from Monroe, La., through which it is running gas from the Richland and Monroe gas fields, mostly its own production, before sending it on to El Dorado through its 10-inch line leased from Continental Supply Co. The plant was built at a cost of $100,000 and handles an average of 20,000,000 feet of gas per day, extracting 8,000 gallons. George T. Koch, chief engineer for the corporation, is in charge of the plant and all other gas operations of the concern.

Richland gas is not quite as rich as that from the Monroe Field or the deep Trinity horizons in Pine Island and Cotton Valley Pools of Caddo and Webster Parishes, yielding only 260 to 325 gallons per 1,000,000 feet, whereas Monroe gas runs about twice as much and Pine Island and Cotton Valley gas slightly more than Monroe.

PHILLIPS CO. TO SUPPLY FUEL FOR MAIL PLANES

The Phillips Petroleum Co. has closed a contract with the Boeing Air Transport Co. covering the gasoline requirements of the latter company in the operation of mail airplanes west of Chicago to Salt Lake City. The Phillips Aviation gasoline will be used. The gasoline is a superstabilized product manufactured at the natural gasoline plant of the Phillips company. Exhaustive tests of this gasoline for airplane use have been made by the Phillips company at its Bartlesville airport.

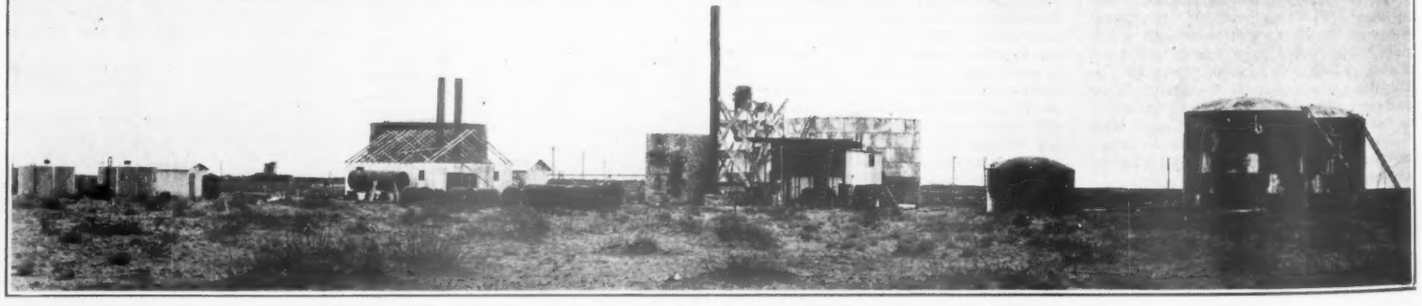
HEADS LUB DIVISION

With the advancement of C. G. Sheffield to be vice president in charge of sales of the Standard Oil Co. of New Jersey, J. Walter Saybolt moved up from assistant to manager of the lubricating division. Mr. Saybolt's father was the late George M. Saybolt, formerly head of the Standard inspection laboratory.

ELECTED VICE PRESIDENT

CHICAGO, Jan. 16.—B. L. Majewski, general sales manager of the Shaffer Oil & Refining Co., has been elected a vice president of the company. The Chicago Oil Men's Club here last week gave a luncheon celebrating Mr. Majewski's birthday.

BUILD WEST TEXAS SKIMMING PLANT IN 32 WORKING DAYS



General view of the Wickett, Tex., skimming plant of the Blue Bonnett Oil & Refining Co.

The Blue Bonnett Oil & Refining Co. has practically completed its 3,500-bbl. skimming plant at Wickett, Tex. The plant was constructed in 32 working days. It is an excellent example of what can be done in the rapid construction of refineries to take advantage of flush production in new fields. The plant cost approximately $50,000.

The plant consists of a complete pipe still unit with a capacity of 3,500 bbls. daily. It includes modern fractionating and heat exchange equipment. It will operate on Winkler County crude oil brought to the plant in a pipe line operated by the Southern Crude Oil Purchasing Co. The plant was designed and built by I. B. Chittenden, superintendent.

Brief Items for Plant Operators

OPERATORS SHIFTING BACK FROM GAS TO FUEL OIL AT REFINERIES

The steady decline in fuel oil prices during the past year with all indications pointing to a continuance of the present low prices over the first half of 1928 at least, many refineries are shifting from gas to fuel oil as fuel for their plant operations. The development reflects the close competitive relationship between the two fuels not only in refinery operations but in their general utilization as fuel in many industries.

The widening distribution of gas particularly in the Southwest during 1926 and 1927 has been held in part responsible for the lower fuel oil prices during the past year. Many refinery organizations which previously had burned their own fuel oil were among those who allowed the gas companies to connect to their plants and furnish them gas as plant fuel.

This widening distribution of gas was aided by the relatively high prices which prevailed for fuel oil during 1926. Refineries found it much more profitable to sell all of their fuel oil production and buy the gas for plant fuel. It was apparent in the Southwest that many other consumers such as local industries and public utility plants were faced with the same condition and as a result late in 1926 and early in 1927 curtailed their purchases of fuel oil from refineries.

Prices on fuel oil due mainly to the overproduction of crude oil the past year have declined to the point where the advantage no longer lies with the gas. A check made of representative refinery organizations during the past week showed that many had curtailed their purchases of gas from gas companies and were using more fuel oil. In some cases the plants are again using 100 per cent fuel oil.

Humble Situation

On the Gulf Coast the Humble Oil & Refining Co. has reduced its purchases of gas for its Baytown Tex. refinery from 16,000,000 to 18,000,000 cubic feet of gas daily to 10,000,000 cubic feet. Several refineries in the coastal area started using gas in 1925-1927 when the gas became available through large gas line connections to the fields in Texas and Northern Louisiana.

In the case of the Humble its contract with the Houston Pipe Line Co. provides for a minimum delivery of 10,000,000 cubic feet of gas daily. Other companies in that area are also said to have long-time contracts binding them to purchase certain specified quantities of gas. For that reason the operators are limited as to the change they can make in the use of fuel oil and gas.

In the Mid-Continent, largely the same situation prevails. One refiner stated that although the advantage at present was in favor of fuel oil at his plant, he preferred to continue the use of gas fearing that he would not be able again to secure the connection should he disconnect. This refiner feels that the low prices for fuel oil are temporary.

Other refiners are continuing the use of gas because they have contracts with the railroads and other consumers which net them an average fuel oil price from 15 to 35 cents a barrel in excess of the present spot market. This situation is not general, however, for regardless of contracts most refineries have sufficient fuel oil to sell on the spot market to furnish their plants' fuel requirements.

Relative Value

At just what point in the relative price structure of fuel oil and gas, the two fuels should be interchanged will of course vary with different refineries and other industrial users. One Oklahoma organization which keeps a close check on its refinery fuel costs states that gas at 15 cents per 1,000 cubic feet (containing 1,000 B.t.u. per foot) is equivalent as plant fuel to 22 gravity fuel oil at a price of 90 cents per barrel. Several other refineries have practically the same comparison as the basis for refinery operations.

The cost of gas in Oklahoma for refinery use varies from 10 to 18 cents with the average around 13 to 15 cents per 1,000 cubic feet. The present spot market for fuel oil in Oklahoma of from 16 to 24 gravity is from 70 to 75 cents a barrel. Thus a refinery selling fuel oil on the spot market and paying 15 cents for gas could save by using fuel oil. In the Oklahoma refinery first mentioned the B.t.u. content of the gas was 1,500 per cubic foot. This B.t.u. content is about 50 per cent greater than the average for Oklahoma. With the 1,500 B.t.u. gas, the Oklahoma refinery could still economically use it as fuel. Refiners who are only paying 10 to 12 cents for their gas of only average B.t.u. content would not better their situation by using 70 to 80-cent fuel oil at their refineries.

Should fuel oil prices continue low it is predicted that there will be a more general return to fuel oil among refineries. As the long time contracts made early in 1927 expire, refiners will be called upon to depend more and more on the spot market to absorb their fuel oil output. Many refiners welcome this development as it will tend to enlarge the fuel oil demand and make possible a speedier return to more normal prices.

NATURAL GASOLINE ASSOCIATION MEETS IN TULSA IN MAY

A. V. Bourque, secretary of the Natural Gasoline Association of America, has announced the date of the next annual meeting as May 22, 23 and 24. It will be held in Tulsa as is customary but will differ somewhat in that a meeting will be held in the evening of the first day instead of holding this night open or providing entertainment as in the past.

This change in the usual program was made in order to allow for a trip to the Seminole Field the last day. Many California representatives will no doubt be interested in this as well as many members coming from other parts of the country who have not seen the developments in that field during the past year.

The program committee, composed of S. B. Carney, chairman; Emby Kaye and E. L. Peck, are now formulating a complete program for the three days. Dr. G. G. Brown, of the University of Michigan, who has conducted two years of research work for the association will be one of the principal speakers.

PHILLIPS CO. TO START NEW PANHANDLE PLANT

The Phillips Petroleum Co will start operating its newest Panhandle natural gasoline plant in about 30 days. It is expected that all the construction work will be completed not later than March 1. The plant is located 8 miles southeast of Pampa in the Bowers Field of Gray County. The field location is the southwest quarter of Section 88. The plant will have an initial output of 15,000 gallons daily with provision made for doubling its capacity as the field is enlarged.

The Texas Railroad Commission has granted the Phillips company permission to sell 25,000,000 feet of residue gas daily from this plant to carbon black companies operating in that area. The commission has also issued an order permitting the company to increase its residue gas sales from its Hutchinson County natural gasoline plants.

AMONG THE TECHNICAL MEN

Ralph E. Goode, chief chemist at the American Refining Co.'s Wichita Falls, Tex., plant, has gained considerable practical training both in refining and in the natural gasoline industry, including construction work on cracking units.

Ralph E. Goode

Upon leaving Southeastern College, at Durant, Okla., he spent one year in construction work on cracking plants for one of the leading manufacturing companies. A few months of his time was spent with the Daisy Belle Co., at Wilson, Okla.

Later he joined the staff of the American company and later was chemist for the Muenster Refining Co., in Cooke County, Texas. Last year he was with the Magnolia Petroleum Co. as chemist at that company's Seminole natural gasoline plant and he served in the same capacity for the Sinclair Oil & Gas Co., in Seminole for a few months before returning to Wichita Falls.

He is the author of several technical papers, some of which have been published recently. During the past year the American Refining Co. started marketing a trade-marked brand of gasoline which has a low boiling point and which was partially brought out through the efforts and experiments carried on in the laboratory. A special method to treat that product for color was developed in the laboratory.

Mr. Goode was born at Earlsboro, Okla., and obtained his high school education at Wilson, Okla.

BUILD SKIMMING PLANT IN WINKLER COUNTY

HOUSTON, Tex., Jan. 14.—Valley View Refining Co., of Wichita, Kans., is building a skimming plant near Monahans, Ward County, Texas. The refinery will have a capacity of 2,500 bbls. daily and will operate on Winkler County crude. It will be in operation in the near future.

Crude will be piped to the plant by the Texon Oil & Land Co., which is laying a 6-inch line from Winkler County to the plant. The latter company also is constructing loading racks on the Texas & Pacific Railroad, on which the refinery is located.

NOT REFINERY SITE

The Marland Refining Co. has no plans for the immediate construction of a refinery at San Angelo, Tex., according to an announcement by C. C. Brown, vice president of the Marland Oil Co. The report regarding the building of a refinery at San Angelo was widely circulated following the purchase of a 500-acre site at San Angelo.

According to Mr. Brown, the land was purchased as a protective measure in the development of its West Texas properties, with no definite plans for its utilization at this time. The property later can be used as a site for a tank farm or refinery if needed by the company.

STANDARD CHANGES

The Standard Oil Co. of New Jersey has announced the transfer of W. J. Haley, manager of the Charleston, S. C., refinery, to take charge of the plant at Havana, Cuba. J. E. Lenhardt, in turn, will be moved to the South Carolina refinery. Both have been in the services of the company for many years and have had experience in several of the plants of the Standard Oil companies.

STANDARD'S SAGINAW PLANT NOW OPERATING

On January 8 the Standard Oil Co. of Indiana started the commercial operation of its new plant near Saginaw, Mich. The refinery site has been given the same name, Zilwaukee. At present the crude runs are being maintained at 800 bbls. daily, the crude coming from the newly developed Saginaw Field. The plant has a capacity of 2,000 bbls. and has been designed and constructed to allow for additional equipment to be installed as the capacity of the plant is increased.

With the addition of this refinery, the company now operates five plants, strategically located throughout the central part of the United States. These are located at Whiting, Ind.; Wood River, Ill.; Sugar Creek, Mo.; Saginaw, Mich., and the group of three refineries under the name of the Midwest Refining Co. located in Wyoming. The combined capacity of these plants amounts to 149,000 bbls. and includes the manufacture of practically every standard petroleum product at one or more of the plants.

REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

GASOLINE AND NAPHTHA

	Jan. 17		Jan. 10		Jan. 3	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.05½	.05¾	.05½	.05⅝	.05½	.05⅝
56-58 450 endpoint	.05½	.05¾	.05½	.05⅝	.05½	.05⅝
58-60 450 endpoint	.05½	.05⅝	.05½	.05⅝	.05⅝	
58-60 437 endpoint (U. S. Motor)	.05⅝	.06	.05⅝	.06	.05¾	.06
60-62 400 endpoint	.06¼		.06¼	.06½	.06⅜	.06½
64-66 375 endpoint	.06¾		.06¾		.06⅞	.07
68-70 360 endpoint	.07	.07⅛	.07	.07⅛	.07⅛	
64-66 437 endpoint (blend)	.05⅝	.05¾	.05⅝	.05¾	.05¾	
KANSAS—						
58-60 437 endpoint (U. S. Motor)	.05⅞	.06⅛	.05¾	.06	.05¾	.06
NORTH TEXAS—						
56-58 450 endpoint	.05½		.05½		.05½	
58-60 450 endpoint	.05½		.05½		.05½	
58-60 437 endpoint (U. S. Motor)	.05⅝	.06	.05⅝	.05⅞	.05¾	.06
60-62 400 endpoint	.06⅜		.06⅜		.06⅜	.06½
64-66 390 endpoint	.06½	.06⅝	.06½	.06⅝	.06½	.06⅝
64-66 375 endpoint	.06¾		.06¾		.06⅞	
68-70 360 endpoint	.07		.07		.07	.07⅛
64-66 437 endpoint (blend)	.05⅝		.05⅝	.05¾	.05¾	
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.06	.06¼	.06½		.06½	.06¾
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.06	.06¼	.06⅜		.06⅜	.06⅝
PENNSYLVANIA—						
52-54 Naphtha	.07½	.07¾	.07½	.07¾	.07¾	.08
54-56 Naphtha	.07½	.07¾	.07½	.07¾	.07¾	.08
58-60 Gasoline	.07¾	.08	.07¾	.08	.07⅞	.08⅛
60 Gasoline	.08⅛	.08¾	.08		.08⅛	.08¾
62 Gasoline	.08¾	.09	.08¾	.09	.08¾	.09
64 Gasoline	.09	.09¼	.09	.09¼	.09	.09¼
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.08	.08½	.08½	.09½	.09	.10
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.05⅝	.05¾	.05⅝		.05⅝	
56-58 450 endpoint	.05⅝	.05¾	.05⅝		.05⅝	
58-60 437 endpoint (U. S. Motor)	.05⅝	.06	.05⅝	.06	.05⅝	.06
60-62 400 endpoint	.06½		.06½		.06½	
64-66 375 endpoint	.06⅞	.07	.06⅞	.07	.06⅞	.07
68-70 360 endpoint	.07⅛	.07¼	.07⅛	.07⅜	.07⅛	.07⅜
64-66 437 endpoint (blend)	.05¾	.06	.05⅞		.05⅞	

NATURAL GASOLINE

	Jan. 17		Jan. 10		Jan. 3	
OKLAHOMA (Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05⅜		.05¼		.05¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05⅛		.04⅞	.05	.04⅞	.05
Grade B, 76-83.9, 375 e.p., rec. 85%	.04	.04¼	.04¼		.04	.04¼
Grade BB, 84-92, 375 e.p., rec. 85%	.04		.04	.04⅛	.04	.04⅛
Grade C, 80-92, 375 e.p., rec. 78%	.03⅝		.03⅝		.03½	.03¾
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05⅜		.05¼		.05¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05	.05⅛	.04⅞		.04⅞	
Grade B, 76-83.9, 375 e.p., rec. 85%	.04	.04¼	.04⅛	.04¼	.04	.04¼
Grade BB, 84-92, 375 e.p., rec. 85%	.04		.04		.04	
Grade C, 80-92, 375 e.p., rec. 78%	.03⅝		.03⅝		.03½	.03⅝
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.05¼		.05¼		.05¼	
Grade BB, 84-92, 375 e.p., rec. 85%	.05⅛		.05⅛		.05⅛	
Grade C, 80-92, 375 e.p., rec. 78%	.04¾		.04¾		.04¾	
CALIFORNIA—						
75-85, 375, 390 endpoint	.07½	.08	.08½	.09	.08½	.09
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.05⅜		.05¼		.05¼	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.05⅛		.04⅞	.05	.04⅞	
Grade B, 76-83.9, 375 e.p., rec. 85%	.04	.04¼	.04¼		.04	
Grade BB, 84-92, 375 e.p., rec. 85%	.04		.04	.04⅛	.04	
Grade C, 80-90, 375 e.p., rec. 78%	.03⅝		.03⅝		.03½	.03⅝

Note: All natural gasoline, except California, is noncorrosive.

BURNING OIL

	Jan. 17		Jan. 10		Jan. 3	
KANSAS—						
41-43 water white Kerosene	.04½		.04½		.04½	
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.04¼	.04⅜	.04¼		.04¼	
42-44 water white Kerosene	.04¾		.04¾		.04¾	.05
NORTH LOUISIANA—						
41-43 prime white Kerosene	.04¾		.05		.05	
NORTH TEXAS—						
41-43 water white Kerosene	.04¼	.04¼	.04⅛	.04⅜	.04⅛	.04⅜
40-42 water white Kerosene	.04⅛		.04⅛		.04⅛	
ARKANSAS—						
41-43 water white Kerosene	.05		.05		.05	
PENNSYLVANIA—						
43 Kerosene prime white	.06	.06¼	.06	.06¼	.06⅛	.06⅜
45 Kerosene water white	.06¼	.06½	.06¼	.06½	.06¼	.06½
46 Kerosene water white	.06½	.06¾	.06½	.06¾	.06½	.06¾
47 Kerosene water white	.07	.07⅛	.07	.07⅛	.07	.07¼
300 Mineral Seal	.07	.07¼	.07	.07¼	.07¼	.07½
CALIFORNIA—						
38-40 water white Kero. (high burning test)	.05½	.06	.05½	.06	.05½	.06
Engine distillate, 43-45, 445 endpoint	.06½	.07	.07	.07¾	.07	.07¾
Engine distillate, 42-44, 480 endpoint	.06¼	.06¾	.06¾	.07	.06¾	.07
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.04¼	.04⅜	.04¼	.04⅜	.04¼	.04½
42-44 water white Kerosene	.04⅝	.04¾	.04½	.04¾	.04¾	.05

FUEL OILS

	Jan. 17		Jan. 10		Jan. 3	
KANSAS—						
18-20 Fuel Oil, per bbl.	.77½	.82½	.77½	.80	.75	.80
22-26 Fuel Oil, per bbl.	.80	.85	.80	.82½	.77½	.80
32-36 Gas Oil	.02½		.02½		.02½	
38-40 Distillate	.03¼	.03⅜	.03¼	.03⅜	.03¼	.03⅜
OKLAHOMA (Group 3)—						
Below 18 Fuel Oil, per bbl.	.70	.75	.70	.75	.70	.75
18-22 Fuel Oil, per bbl.	.75	.77½	.75	.77½	.75	.77½
22-26 Fuel Oil, per bbl.	.77½	.80	.77½	.80	.77½	.80
24-26 Fuel Oil, per bbl	.80	.85	.80	.85	.80	.85
26-30 Fuel Oil, per bbl.	.85	.87½	.85	.87½	.85	.87½
28-30 Fuel Oil, per bbl.	.90	.95	.90	.95	.90	.95
32-36 Gas Oil (dark)	.02⅜		.02¼	.02⅜	.02¼	.02⅜
32-36 Gas Oil (straw overhead)	.02½		.02⅜	.02½	.02⅜	.02½
36-38 Distillate	.03	.03¼	.03	.03¼	.03	.03¼
38-40 Straw Distillate	.03	.03½	.03	.03½	.03	.03½
NORTH TEXAS—						
24-26 Fuel Oil (Sellers' cars), per bbl.	.75	.80	.75	.80	.75	.80
32-36 Gas Oil (straw)	.02¼	.02⅜	.02¼		.02¼	
38-40 Straw Distillate	.03		.03		.03	
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.97½		1.00		1.00	
32-36 Gas Oil	.03		.03	.03¼	.03	.03¼
ARKANSAS—						
33-36 Distillate	.03½	.03¾	.03½	.03¾	.03½	.03¾
32-36 Gas Oil (straw)	.02¾		.02¾		.02¾	
16-20 Refinery Fuel Oil, per bbl.	.95		.95		.95	
GULF COAST (South Texas)—						
Gas Oil	.04¼	.04½	.04¼	.04½	.03⅞	.04
Fuel Oil, per bbl.	1.25	1.30	1.25	1.30	1.25	1.30
PENNSYLVANIA—						
30-34 Fuel Oil, per bbl.	.04⅜	.04⅝	.04⅜	.04⅝	.04¼	.04⅝
36-40 Fuel Oil, per bbl.	.04½	.04¾	.04½	.04¾	.04⅜	.04⅝
CALIFORNIA—						
33-36 Distillate	.03½	.03¾	.03½	.03¾	.03¼	.03⅜
27-32 Distillate	.02½	.03	.02¼	.03	.02¼	.03
*15-20 Fuel Oil, Bunker (at tide water)	1.00		1.00		1.00	
15-20 Fuel Oil (cargo lots), per bbl.	.90		.90		.90	
27 plus Diesel, per bbl.	1.15	1.19	1.15	1.19	1.15	1.19
CHICAGO DISTRICT (Based on Group 3)—						
24-26 Fuel Oil (sellers' cars) Group 3, bbl.	.77½	.82½	.77½	.82½	.77½	.82½
22-26 Fuel Oil (sellers' cars) Group 3, bbl.	.75	.80	.75	.80	.75	.80
18-22 (Group 3), per bbl.	.72½	.75	.72½	.75	.72½	.75
16-20 Smackover, per bbl.	1.00	1.02½	1.00	1.02½	1.00	
32-36 Gas Oil (zero)	.02¾	.03	.02¾	.03	.02¾	.03
32-36 Gas Oil (industrial)	.02½	.02⅝	.02½	.02⅝	.02½	.02⅝
36-38 Distillate	.03	.03¼	.03⅛	.03¼	.03⅛	.03¼
38-40 Straw Distillate	.03¼	.03⅜	.03¼	.03½	.03¼	.03⅜

*Bunkers.

LUBRICATING OIL AND WAX

	Jan. 17		Jan. 10		Jan. 3	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.06¼	.06½	.06¼	.06½	.06¼	.06½
100 vis., 3 color, 20-25 cold test	.06	.06¼	.06	.06¼	.06	.06¼
150 vis., 3 color, 20-25 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
150 vis., 4 color, 20-25 cold test	.08	.08¼	.08	.08¼	.08	.08¼
180 vis., 3 color, 23-28 cold test	.09⅜	.10	.09⅜	.10	.09⅜	.10
180 vis., 4 color, 23-28 cold test	.09¼	.09¾	.09¼	.09¾	.09¼	.09¾
180 vis., 5 color, 23-28 cold test	.09⅛	.09½	.09⅛	.09½	.09⅛	.09½
200 vis., 3 color, 23-28 cold test	.09½	.10½	.09½	.10½	.09½	.10½
200 vis., 4 color, 23-28 cold test	.09⅜	.10¼	.09⅜	.10¼	.09⅜	.10¼
200 vis., 5 color, 23-28 cold test	.09¼	.10	.09¼	.10	.09¼	.10
240 vis., 3 color, 25-30 cold test	.13¾	.14	.13¾	.14	.13¾	.14
240 vis., 4 color, 25-30 cold test	.13¼	.13½	.13¼	.13½	.13¼	.13½
240 vis., 5 color, 25-30 cold test	.12¼	.12½	.12¼	.12½	.12¼	.12½
280 vis., 3 color, 25-30 cold test	.15½	.16	.15½	.16	.15½	.16
280 vis., 4 color, 25-30 cold test	.15	.15½	.15	.15½	.15	.15½
280 vis., 5 color, 25-30 cold test	.14	.14½	.14	.14½	.14	.14½
Cylinder Stocks:						
600, steam refined, light green	.08	.09½	.08	.09½	.08	.09½
600, steam refined, dark green	.07	.07½	.07	.07½	.07	.07½
190-200 vis. @ 210 Bright Stock	.30	.32	.30	.32	.30	.32
150-160 vis @ 210 Bright Stock	.23	.25	.23	.25	.24	.25
Waxes:						
124-126 White Crude Scale Wax	.02⅝	.02¾	.02⅝		.02½	.02⅝
PENNSYLVANIA—						
34 Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
34 Sundebloom	.07¾	.08	.07¾	.08	.07¾	.08
36 Miners' Neutral	.07½	.07¾	.07½	.07¾	.07½	.07¾
150, 3 color	.26½	.27	.26½	.27	.26½	.27
180, 3 color	.31	.31½	.31	.31½	.31	.31½
200, 3 color	.32	.32½	.32	.32½	.32	.32½
220, 3 color	.34½	.35	.34½	.35	.34½	.35
600, steam refined	.09¼	.09¾	.09½	.10	.09½	.10
635, steam refined	.11	.11¼	.11	.11¼	.11	.11¼
650, steam refined	.11½	.12	.11½	.12	.11½	.12
600, Pennsylvania flash	.15	.16	.15	.16	.15	.16
*550, E Filtered	.15¾	.16	.15¾	.16	.15¾	.16
*600, E filtered	.16½	.17	.16½	.17	.16½	.17
600, E filtered	.15½	.16	.15½	.16	.15½	.16
600, D filtered	.24½	.25	.24½	.25	.24½	.25
550, E filtered	.15½	.16	.15½	.16	.15½	.16
550, D filtered	.21½	.22	.21½	.22	.21½	.22
Pennsylvania Bright Stock	.28½	.29	.28½	.29	.28½	.29
†122-124 White Crude Scale Wax	.03	.03⅛	.02⅞	.03	.02⅞	.03
124-126 White Crude Scale Wax	.03	.03⅛	.02⅞	.03	.02⅞	.03

*At Warren, Pa. †At New York City.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06½	.07½	.06½	.07½	.06¼	.07
No. 3 color, 200 vis., pale oil	.09	.09½	.09	.09½	.08¾	.09
No. 3 color, 300 vis., pale oil	.10½	.11½	.10½	.11½	.10	.10½
No. 3½ color, 500 vis., pale oil	.12	.13	.12	.13	.11½	.12
No. 4 color, 750 vis., pale oil	.14	.15	.14	.15	.14	.14½
No. 5 to 6 color, 200 vis., red oil	.07½	.08	.07½	.08	.07½	.08
No. 5 to 6 color, 300 vis., red oil	.08½	.09	.08½	.09	.08½	.09
No. 5 to 6 color, 500 vis., red oil	.09½	.10½	.09½	.10½	.09½	.10½
No. 5 to 6 color, 750 vis, red oil	.12	.12½	.12	.12½	.12	.12½
No. 2½ color, 200 vis., pale filtered	.11½	.12	.11½	.12	.11½	.12½
No. 2½ color, 300 vis., pale filtered	.13	.13½	.13	.13½	.13	.13½
No. 2½ color, 500 vis., pale filtered	.14	.15	.14	.15	.14	.14½

REFINERY AND CRUDE PRICES

Quotations on Principal Refined Products and Crude Petroleum Markets in All the American Oil Fields

No. 2½-3 color, 750 vis., pale filtered	.17½	.19	.17½	.19	.17½	.19
CALIFORNIA—						
130 vis., 2½-3 color	.09	.10	.09	.10	.09	.10
200 vis., 2½-3 color	.10	.10½	.10	.10½	.10	.10½
300 vis., 3-3½ color	.10½	.11	.10½	.11	.10½	.11
350 vis., 3½-4 color	.11	.12	.11	.12	.11	.12
400 vis., 3½-4 color	.13	.14	.13	.14	.13	.14
Red Neutral:						
200 vis., 4½-5 color	.08½	.09	.08½	.09	.08½	.09
300 vis., 5-6 color	.09	.09½	.09	.09½	.09	.09½
400 vis., 5-6 color	.11	.11½	.11	.11½	.11	.11½
500 vis., 4½-5 color	.11½	.12	.11¼	.12	.11¼	.12
500 vis., 5-6½ color	.11	.11½	.11	.11½	.11	.11½
600 vis., 6 plus color	.12	.12½	.12	.12½	.12	.12½

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Jan. 17	Jan. 10	Jan. 3
Gasoline, U. S. Motor, 58-60 437	.08¼	.08¼	.08¼
Kerosene, water white, 41-43	.07½	.07½	.07½
*Fuel Oil, bunker "C," 14-16, per bbl.	1.35	1.35	1.35
*Fuel Oil, Diesel, 28-30, per bbl.	2.10	2.10	2.10
Gas Oil, 28 plus	.05½	.05½	.05½
25 pale Paraffin Oil	.12	.12	.12
28 pale Paraffin Oil	.07	.07	.07
285 red Paraffin Oil	.11½	.11½	.11½
250 red Paraffin Oil	.10½	.10½	.10½
225 red Paraffin Oil	.09½	.09½	.09½
200 red Paraffin Oil	.09	.09	.09
Refined Wax:			
120-122 a.m.p., per lb.	.03⅞	.03⅞	.03⅞
125-127 a.m.p., per lb.	.04	.04	.04
130-132 a.m.p., per lb.	.04½	.04½	.04½
135-137 a.m.p., per lb.	.05¼	.05¼	.05¼
Petrolatum, in bbls., carload lots, per lb.:			
Dark green	.01⅞	.01⅞	.01⅞
Amber	.03⅜	.03⅜	.03⅜
Extra amber	.03¾	.03¾	.03¾
Cream	.06½	.06½	.06½
Lily White	.08½	.08½	.08½
Snow White	.09½	.09½	.09½

*Lighterage, 6.5c a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Jan. 17	Jan. 10	Jan. 3
Gasoline, U. S. Motor, 58-60 437, in cases	.2390	.2390	.2390
Kerosene, standard white, in cases	.1715	.1715	.1715
Kerosene, water white, in cases	.1815	.1815	.1815
600 steam refined cylinder stock, in bbls.	.17	.17	.17
635, steam refined	.19	.19	.19
650, steam refined	.20	.20	.20
600, Pennsylvania flash	.23	.23	.23
630, Pennsylvania flash	.35	.35	.35
600, Warren E	.25	.25	.25
600, Oil City E	.24	.24	.24
Light 135 Bright Stock	.40	.40	.40
Dark 135 Bright Stock	.38	.38	.38

LOS ANGELES EXPORT PRICES

	Jan. 17		Jan. 10		Jan. 3	
Kerosene, water white	.04½	.05	.04½	.05	.04¾	.05
U. S. Motor Gasoline, 53-55 437 e.p.	.06	.06⅛	.06	.06⅛	.06	.06⅛

CALIFORNIA CRUDE PRICES

Standard Oil Co.-Union Oil Co. (Effective April 1, 1927)*

Gravity—	1 Fullerton, Seal Beach, Long Beach, Huntington Beach, Richfield, Rosecrans-Dom'guez, Torrance-Inglewood	2 Whittier, La Habra, Montebello	3 Kern River, Newhall-McKittrick, Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills	4 Coyote	5 Santa Fe Springs	6 Coalinga	7 Wheeler Ridge	8 Santa Maria, Ventura, Orcutt, Salt Lake
14°	.85	.85	.75	.85	....	.75	.75	.85
15°	.85	.85	.75	.85	....	.75	.75	.85
16°	.85	.85	.75	.85	....	.75	.75	.85
17°	.85	.85	.75	.85	....	.75	.75	.85
18°	.85	.85	.75	.85	....	.75	.75	.85
19°	.85	.85	.75	.85	....	.75	.75	.85
20°	.85	.85	.77	.85	....	.76	.76	.85
21°	.86	.85	.79	.86	.85	.77	.77	.85
22°	.87	.85	.81	.87	.85	.78	.78	.85
23°	.88	.85	.83	.88	.85	.79	.79	.85
24°	.89	.85	.85	.89	.85	.80	.80	.85
25°	.90	.86	.87	.90	.86	.81	.81	.86
26°	.92	.87	.89	.91	.87	.83	.82	.87
27°	.94	.88	.91	.92	.88	.85	.83	.88
28°	.96	.89	.93	.93	.89	.87	....	.89
29°	.98	.90	.96	.94	.91	.89	....	.91
30°	1.00	.91	.99	.95	.93	.91	....	.93
31°	1.03	....	1.02	....	.95	.93	....	.95
32°	1.06	....	1.05	....	.97	.95	....	.97
33°	1.09	....	1.08	....	.99	.97	....	.99
34°	1.12	....	1.11	....	1.01	.99	....	1.01
35°	1.15	....	....	....	1.03	1.01	....	1.03
36°	1.18	....	....	....	1.06	....	....	1.06
37°	1.21	....	....	....	1.09	....	....	1.09
38°	1.24	....	....	....	1.12	....	....	1.12
39°	1.27	....	....	....	1.15	....	....	1.15
40°	1.30	....	....	....	....	....	....	....
41°	1.33	....	....	....	....	....	....	....
42°	1.36	....	....	....	....	....	....	....

*Column 1—Long Beach, Seal Beach and Huntington Beach crudes, 14 to 32 degrees, inclusive; Richfield and Fullerton, 14 to 30 degrees; Torrance and Inglewood, 14 to 28 degrees; Domingues, 24 to 42 degrees. Rosecrans crude ranges from 14 to 42 degrees, but only Union Oil Co. posts below 24 degrees.

Column 2—Whittier crude, 14 to 22 degrees; Montebello, 14 to 30 degrees.

Column 3—Kern River, Newhall and McKittrick, 14 to 19 degrees; Midway-Sunset, Buena Vista and Elk Hills, 14 to 33 degrees; Lost Hills and Belridge, 14 to 34 degrees.

Column 8—Salt Lake, 14 to 19 degrees, inclusive; Santa Maria, 14 to 30 degrees; Ventura and Orcutt, 14 to 39 degrees. Posted only by Union Oil Co.

CRUDE OIL GRAVITY TABLE

Gravity—	1 Okla., Kans., N. C. Tex., La.-Ark.	2 Smackover, Ark.	3 Stephens, Ark.	4 Gray County (Texas Panhandle)	5 Crane, Upton, Pecos, Crockett Counties (West Texas)	6 Salt Creek, Wyo.	7 Grade B & Light Crude (G. Coast)	8 Somerset (South Central Texas)
24 and above	....	1.00	....	....	....	....	....	....
Below 24	....	.85	....	....	....	....	....	....
Below 25	....	....	....	....	....	....	1.16	....
25 to 25.9	....	....	....	....	....	....	1.17	....
Below 26	....	....	....	....	.60	....	....	....
26 to 26.9	....	....	....	....	.60	....	1.19	....
27 to 27.9	....	....	....	....	.60	....	1.21	....
Below 28	(*)	....	1.00	....	....	....	....	....
28 to 28.9	1.12	....	1.02	.80	.60	....	1.23	....
29 to 29.9	1.14	....	1.04	.82	.60	1.14	1.25	....
30 to 30.9	1.16	....	1.06	.84	.60	1.16	1.27	....
31 to 31.9	1.18	....	1.08	.36	.60	1.18	1.29	....
32 to 32.9	1.20	....	1.10	.88	.60	1.20	1.31	1.05
33 to 33.9	1.22	....	....	.90	.60	1.22	1.33	1.07
34 to 34.9	1.24	....	....	.92	.60	1.24	1.35	1.09
35 to 35.9	1.26	....	....	.94	.60	1.26	1.37	1.11
36 to 36.9	1.28	....	....	.96	.60	1.28	....	1.13
37 to 37.9	1.30	....	....	.98	..	1.30	....	1.15
38 to 38.9	1.32	....	....	1.00	....	....	....	1.17
39 to 39.9	1.34	....	....	1.02	....	....	....	....
40 to 40.9	1.36	....	....	1.04	....	....	....	....
41 to 41.9	1.38	....	....	1.06	....	....	....	....
42 to 42.9	1.40	....	....	1.08	....	....	....	....
43 to 43.9	1.42	....	....	1.10	....	....	....	....
44 to 44.9	1.44	....	....	1.12	....	....	....	....
45 to 45.9	1.46	....	....	....	....	....	....	....
46 to 46.9	1.48	....	....	....	....	....	....	....
47 to 47.9	1.50	....	....	....	....	....	....	....
48 to 48.9	1.52	....	....	....	....	....	....	....
49 to 49.9	1.54	....	....	....	....	....	....	....
50 to 50.9	1.56	....	....	....	....	....	....	....
51 to 51.9	1.58	....	....	....	....	....	....	....
52 and above	1.60	....	....	....	....	....	....	....

Column 1—Magnolia Petroleum Co. posted new schedule September 14, making price below 30 gravity $1.05 per barrel, with 2 cents increase per degree higher in gravity, taking 30-30.9 gravity at $1.16 as basis, with a top price of $1.60 for 52 and above.

Oklahoma—Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., March 12; Carter Oil Co., The Texas Company, March 14.

North Central Texas—[Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas), Iatan and Panola (Magnolia only. Iatan posted on flat price of $.93 by Magnolia on January 14, 1928). Currie, Nocona, Moran and Corsicana light]; Texas, Prairie, Sinclair and Gulf, March 12; The Texas Company, Humble Oil & Refining Co., March 14.

Kansas—Prairie, Sinclair, March 12; Carter, Texas, March 14.

Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, De Soto, Haynesville, Homer and El Dorado only]; Standard Oil Co. of Louisiana, March 14; The Texas Company, March 14; Magnolia Petroleum Co., Pine Island, Haynesville and Bull Bayou, El Dorado, Gulf Pipe Line Co., March 14.

Column 2—November 19, Louisiana Oil & Refining Co. On November 31, Standard Oil Co. of Louisiana, Magnolia Petroleum Co., Gulf Refining Co., and Atlantic Producing Co.

Column 3—Atlantic Oil Producing Co., March 14.

Column 4—Humble Oil & Refining Co. and Gulf Pipe Line Co., March 14. On August 23 Magnolia Petroleum Co. posted flat 75 cents.

Column 5—Humble Oil & Refining Co., August 23; Kay County Gas Co., Magnolia Petroleum Co., and Gulf Pipe Line Co., August 24.

Column 6—Midwest Refining Co., March 12. All crude over 37 gravity, $1.30 per barrel.

Column 7—Humble Oil & Refining Co. and other major buyers (schedule ends "35 and above"), March 14, with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. posts 2 cents differential for each degree above 35 gravity and $1.47 for 40 gravity and above.

Column 8—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

*Prices for crude below 28 gravity; Oklahoma, Kansas and Texas, Magnolia Petroleum Co., $1.10, March 12; Arkansas, North Louisiana, March 14. Other companies, 2 cents less for each degree, with exception of Humble Oil & Refining Co., which pays 90 cents for crude below 25 degrees gravity, effective November 16.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

*Corsicana heavy (March 14, 1927)	$1.00
Other fields	See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE

*Carson County	$ .75
*Hutchinson County	.75
*Wheeler County	.75
Gray County	See gravity table

*Humble Oil & Refining Co.
Magnolia Petroleum Co., Gulf Pipe Line Co., and Kay County Gas Co., August 23.

*Iatan	Same as North Texas
Crane-Upton-Crockett	See gravity table
†Glasscock	.60
†Chalk	.80

*Includes Howard County and Westbrook Fields. Kay County Gas Co. pays $1.05 for Howard County crude, effective May 21.
†Magnolia Petroleum Co., Jan. 14, 1928.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Dec. 2)	$ .85
Bellevue (Feb. 24, 1927)	1.20
Urania (Nov. 18, 1927)	.75
East El Dorado (Sept. 20)	.90
Other fields	See gravity table

Note—Cotton Valley and Bellevue, Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co. and Magnolia Petroleum Co.; Urania, Louisiana Oil Refining Corp.; East El Dorado Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST

(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, High Island, Pierce Junction and Spindletop.)

‡Grade A (March 14)	$1.20
Grade B	See gravity table
*Jennings, La. (March 14)	$1.05
†Saratoga, Batson, Dayton (March 14, 1927)	$1.20
§Markham (March 14)	1.00

*Gulf Pipe Line Co. †Sun Pipe Line Co. ‡Humble Oil & Refining Co. and other major buyers. §The Texas Company.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

*Luling (May 5)	$1.00
†Mirando (March 14)	1.00
Rockdale-Minerva (April 15):	
Below 38 gravity	1.25
38-38.9 gravity	1.27
39-39.9 gravity	1.29
40 and above	1.31
*Thrall	See gravity table
Callihan (May 15)	1.75
Lytton Springs (Lockhart)	See gravity table
Somerset	See gravity table

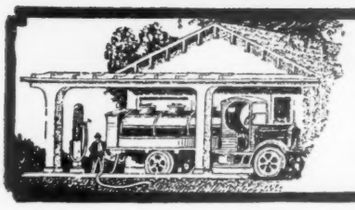
*Posted by Magnolia Petroleum Co. Thrall prices same as North Central Texas less 19½ cents per cwt. freight.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.

ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.
(Effective March 14)

Rock Creek, Wyo (March 13)	$1.25
Salt Creek	See gravity table
Big Muddy (March 12)	$1.25
Mule Creek (May 1)	1.10
Grass Creek, heavy	.90
Grass Creek, light	1.33
Elk Basin (March 12)	1.33
Lance Creek (March 13)	1.33
Poison Spider	1.00
Notches	.85
Rex Lake (February 22)	1.10
Osage	1.33
Lost Soldier (contract)	.95
Greybull-Torchlight	1.33
Hamilton Dome	.85
Cat Creek (Mont.)	1.33

(Continued on Page 144)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns Jan. 17.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Chicago dist.	16.0	18 0	2 0	12 0
Decatur, Ill.	15.5	17.5	2.0	12.1
E. St. Louis	15 1	17.35	2.0	11 2
Joliet	16.4	18 4	2 0	12.3
Peoria	12.0	12.0	2.0	12.1
Quincy	16 2	18 2	2.0	11 9
Davenport, Ia.	15.5	17 5	3.0	12 3
Des Moines	15.9	17.9	3.0	12.3
Keokuk	17	19.5	3.0	12 3
Sioux City	17.1	19 1	3.0	11 9
Duluth, Minn.	15 5	17 5	2 0	12.9
Minneapolis	14 0	14.0	2.0	12 9
Mankato	14.1	16 1	2 0	12 7
LaCross, Wis.	17.2	19 2	2 0	13.0
Milwaukee	16.1	18 1	2.0	11 9
Madison	16 3	18 3	2.0	12 1
Detroit, Mich.	15 8	17.8	3.0	13 7
Grand Rapids	14 0	16.0	3.0	13 6
Saginaw	17 9	19.9	3 0	13 8
Evansville, Ind.	17.0	19 0	3 0	13 0
Ft. Wayne	16.4	17.4	3.0	13.4
Indianapolis	14 2	15 2	3.0	12.2
South Bend	17 4	17.4	3 0	13.4
Fargo, N. D.	15 0	17.0	2 0	14 9
Huron, S. D.	19 5	21.5	4.0	13 9
Sioux Falls	16.0	18.0	4.0	13.4
*K. C., Mo.	14 9	16.9	3 0	10 6
*Springfield	16 8	18 8	3 0	11.5
*St. Louis	15 6	17 9	2.5	11.3
*St. Joseph	14 5	16 5	3.0	11.2
Wichita, Kans.	12.8	12.8	2.0	10.8
Bartlesville, Ok.	15.8	17.8	3.0	10 8

NAPHTHAS

	Tank wagon	Tank car
Oleum spirits	14.7	9 5
V. M. & P. naphtha	16 2	11.0
Cleaner's naphtha	18.0	12 0
Stanisol	19 0	12 5

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9 0
100 to 799 gallons	8.0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

Tank wagon prices of gasoline subject to discount of 1 cent a gallon on dumps of 50 gallons or more throughout territory except Chicago district where discount applies only to dumps of 100 gallons. Kerosene subject to 1 cent discount on dumps of 50 gallons or more.

Outside the Chicago district, the following quantity discount schedule is in effect on monthly tank wagon deliveries of gasoline; 6,000 gallons or more, 1½ cents; 10,000 gallons or more, 2 cents; 15,000 gallons or more, 3 cents. These discounts include the 1 cent allowed on dumps of 50 gallons or more at one delivery.

Within the Chicago district, the following quantity discount schedule is in effect on tank wagon deliveries of gasoline; 750 to 2,000 gallons, one-half cent; 2,000 to 3,000 gallons, three-fourths cent; 3,000 to 6,000 gallons, 1 cent; 6,000 to 10,000 gallons, 1¼ cents; 10,000 to 15,000 gallons, 2 cents; 15,000 gallons or more, 3 cents. These discounts are in addition to the special discount of 1 cent on dumps of 100 gallons or more at one delivery.

If the quantity bought during the year is equal to or exceeds 12 times the agreed monthly quantity, the discount is paid or credited on the entire quantity at the close of the term less the monthly payments made during the year.

*State tax 2 cents; remainder city tax.

OHIO

Standard Oil Co. (Ohio)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
All Ohio points	17.0	19.0	3.0	14.5

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.*

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Dallas, Tex.	14.0	17.0	3.0	11 0
Fort Worth	14.0	16.0	3.0	10 0
Houston	13.0	15.0	3.0	15 0
San Antonio	13.0	15.0	3.0	10 0
El Paso	14 0	15 0	3.0	16.0
Texarkana	15.0	18.0	3.0	12 0
Muskogee, Ok.	15.0	18 0	3.0	10.0
Okla. City	13.0	14 0	3.0	10 0
Tulsa	13 0	14 0	3.0	10 0
Ft. Smith, Ark.	14.0	17.0	5.0	10.0
Little Rock	16.0	16.0	5.0	11.0

*The following is the schedule of discounts on quantity gasoline sales adopted by the Magnolia Petroleum Co. in Oklahoma: Over 750 gallons a month, one-half cent; over 2,000 gallons, three-quarters cent; over 3,000 gallons, 1 cent; over 4,500 gallons, 1¼ cents; over 6,000 gallons, 1½ cents; over 8,000 gallons, 1¾ cents; over 10,000 gallons, 2 cents. If the quantity bought during the year is 12 times the monthly agreed purchases, the discount will be paid or credited on the entire quantity for the year less any monthly purchases.

The schedule on service station deliveries is: Over 200 gallons a month, 1 cent; over 300 gallons a month, 1¼ cents; over 400 gallons, 1½ cents; over 500 gallons a month, 1¾ cents; over 600 gallons, 2 cents. The same rule applies for annual purchases in the tank wagon discounts.

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
*N. Orleans, La.	15.5	17 5	3 0	14 0
Baton Rouge	14 0	17.0	2.0	12 5
Alexandria	15 0	18.0	2 0	14 0
LaFayette	15 0	18.0	2.0	13 5
Lake Charles	15 5	18 5	2 0	14 0
Shreveport	15 5	18 5	2.0	13 0
Kn'xville, T'nn.	19.5	22 5	3 0	15 0
Memphis	15.0	16 5	3 0	14.0
Chattanooga	19.5	22 5	3 0	15 0
Nashville	18 0	21 0	3.0	15.0
Bristol	19 0	22.0	3.0	14.0
Lit. Rock, Ark.	16.0	16.0	5.0	12.0

*Tax of 3 cents includes city tax of 1 cent.
*Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Atlanta, Ga.	17.0	19.0	4.0	14.0
Augusta	19.0	22 0	4 0	16 5
Macon	16.0	19.0	4.0	13.5
Savannah	17 0	19 0	4 0	14.5
Birm'h'm, Ala.	18.0	21.0	4.0	14.5
Mobile	17.0	20.0	4.0	14.0
Montgomery	16.0	19.0	5.0	15.5
Clarks'le, Miss.	17.0	20.0	4.0	11.5
Jackson	17.0	20.0	4.0	11.5
Natchez	16.5	19 5	4.0	14 0
Gulfport	18 5	21 5	6 0	14 0
Vicksburg	16 5	19.5	4 0	14 0
Jack'ville, Fla.	18.0	21.0	5.0	11.5
Miami	20 0	23.0	5.0	14.5
Pensacola	19.0	22.0	5.0	13.0
Tampa	18.0	21.0	5.0	13.0
Lexington, Ky.	18 0	21.0	5 0	16 5
Covington	19.0	22 0	5.0	15 5
Louisville	18.0	21.0	5.0	15.0

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline. Kerosene prices in Georgia includes 1 cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene only. Pensacola tax includes 1 cent city levy. Gulfport tax includes privilege tax of 2 cents in addition to state tax.

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

Atlantic Refining Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Pittsburgh, Pa.	16 0	*22 0	...	14 0
Philadelphia	15.0	*21.0	...	14.0
Scranton	16 0	*22 0	...	14 0
Allentown	16 0	*22.0	...	14 0
Altoona	16 0	*22 0	...	14.0
Erie	12 0	*18.0	...	14 0
Dover, Del.	19 0	22 0	3.0	14 0
Wilmington	19.0	22 0	3.0	14.0
Spring'd, Mass.	18 0	18 0	...	15.0
Worchester	17 0	17 0	...	15 0
Boston	17 0	17.0	...	15 0
Providence, R.I.	19.0	19 0	2 0	15 0
Hartford, Conn.	20.0	20 0	2 0	15 0
New Haven	20 0	20.0	3.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the state.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Albany, N. Y.	17.0	19 0	...	15 0
*New York	17 0	19.0	...	15 0
Buffalo	17.0	19 0	...	14 0
Rochester	13 0	16 0	...	14.0
Syracuse	17 0	19 0	...	15 0
Boston, Mass.	17 0	19 0	...	15 0
Augusta, Me.	21 0	23 0	4.0	15.0
M'nch't'r, N.H.	19.0	23.0	4.0	15.0
Burlington, Vt.	20.0	22.0	3.0	15.0

*Price in steel barrels.

PACIFIC COAST DISTRICT

Standard Oil Co. (California)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
San Francisco	17 0	21.0	3 0	15 5
Pueblo	18.0	18.0	3 0	15 5
Los Angeles	16 5	20.5	3.0	15 5
Reno, Nev.	22 0	26 0	4 0	19 0
Portland, Ore.	17 5	21 5	3.0	16 5
Seattle, Wash.	16 5	20 5	3 0	16 5
Tacoma	16.5	20.5	3 0	16 5
Spokane	20.5	24.5	3.0	20 5
Phoenix, Ariz.	23.0	27.0	4.0	20.5

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Atlantic City	18.0	20 0	2 0	14 0
Newark, N. J.	18 0	20 0	2 0	14.0
Annapolis, Md.	20.0	23 0	4 0	12.0
Baltimore	20.0	23.0	4 0	10 0
Cumberland	20 0	23 0	4 0	14 0
Washington	18.0	21 0	2.0	12 0
Danville, Va.	20 5	....	4 5	14.0
Norfolk	20 5	23 5	4.5	12 0
Petersburg	20 5	23.5	4 5	14 0
Roanoke	20 5	23.5	4 5	14.0
Richmond	18.5	21 5	4.5	14 0
Ch'rslt'n, W.Va.	20 0	23.0	4 0	14 0
Keyser	20 0	....	4 0	14.0
Parkersburg	17 0	20.0	4 0	14.0
Wheeling	20 0	23 0	4 0	14 0
Charlotte, N. C.	20 0	23.0	4 0	14 0
Hickory	20.0	23 0	4.0	14.0
Mt. Airy	20 0	23 0	4.0	14 0
Salisbury	20 0	23 0	4 0	14.0
Charlst'n, S. C.	20 0	23 0	5 0	14.0
Columbia	20.0	20 0	5.0	14.0

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Omaha	14.25	16 26	2 0	12.25
McCook	14 75	14 75	2 0	11 50
Norfolk	16 75	18 75	2 0	12 75
N. Platte	17 75	19 75	2.0	13 50
Scottsbluff	17.25	19 25	2.0	13.00

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline Tank wagon	Gasoline Service station	Gasoline Incl'd's tax of	Kero. tank wagon
Denver, Colo.	16.0	18.0	3.0	12.5
Pueblo	16.0	18.0	3.0	14.5
Grand Jnctn.	20 5	22.5	3 0	18.0
Casper, Wyo.	17 0	19 0	3.0	13 0
Cheyenne	18 0	20 0	3.0	14 5
Butte, Mont.	22 5	22 5	3.0	19 0
Helena	22.5	24 5	3.0	19 0
Salt L'ke, Utah	20 0	21 0	3.5	17.0
Albu'que, N. M.	21 0	24.0	5 0	17.0
Boise, Idaho	23 5	25 5	4 0	19 0
Twin Falls	23 5	25 5	4.0	19.0

TANK WAGON CHANGES

January 7—Standard Oil Co. of Indiana increased the gasoline tank wagon and station prices 2 cents at Decatur, Ill., to 15.5 and 17.5 cents.

January 10—Continental Oil Co. increased the gasoline tank wagon and station prices one-half cent in Butte, Mont.

January 11—Magnolia Petroleum Co. increased the gasoline tank wagon price 1 cent and the station price 3 cents in Texarkana, making the new prices 15 cents and 18 cents.

CRUDE CHANGES

January 14 — Magnolia Petroleum Co. reduced the posted price on Glasscock County, West Texas, crude to 60 cents. The same price was posted on all Howard County crude also, with the exception of that produced in the Chalk Field, which was posted at 80 cents. Iatan crude was posted on a flat price of 93 cents.

HEALDTON-MEXIA LOOP READY WITHIN 90 DAYS

FORT WORTH, Tex., Jan. 14.—Construction work has been started on the Sinclair Pipe Line Co.'s 162-mile 8-inch loop on its line from Healdton, Okla., to Mexia, Texas, and the project is expected to be completed within 90 days at the outside. The line will be welded throughout.

Two gangs have been started out of Belcherville in North Texas and will work north while the other works south. Two more gangs have been started out of Hensley in Jack County, one working south and the other north and the fifth gang is to be started north out of Mexia within a few days.

An extra unit will be installed in the Cresson station 25 miles south of Fort Worth and an extra unit will be installed in Lakenon station seven miles south of Hillsboro. The extra station capacity and the added line capacity will give the Sinclair Co. a rated capacity of 35,000 bbls. daily between the two points.

The 8-inch line now in service between Healdton to Mexia can handle around 18,000 bbls. North from Healdton and south of Mexia the pipe line company has ample line capacity for its line running to the refinery on the Gulf Coast. To keep the line south from Mexia operating at maximum capacity to fulfill contracts it was necessary to draw heavily on storage at Mexia. Sinclair Co.'s recently announced plans for large scale refining expansion on the Gulf Coast was another reason for more line capacity.

It is estimated that the loop will be completed within 60 days with favorable weather, but 90 days at the outside.

OSAGES BEING HEARD ON NEW LEASING BILL

WASHINGTON, D. C., Jan. 17.—Members of the Osage tribe of Indians today presented to the House Committee on Indian Affairs arguments in favor of their bill to extend the tribal period beyond 1931 and also to permit both the owner of the surface and the oil leessee equal rights in arbitration and in appeals to United States courts.

This bill contemplates the passage of an act to give the Secretary of the Interior discretionary power in the leasing of Osage oil lands in place of the present law directing him to lease 100,000 acres of such land annually.

SHELL WINKLER LINE READY

HOUSTON, Tex., Jan. 16.—Shell Pipe Line Co. (Roxana Petroleum Corp.) has about completed the laying of its 6-inch line from the Wink'er County Field of West Texas to loading racks near Monahans, Ward County, a distance of approximately 20 miles.

CRUDE OIL PRICES

(Continued from Page 143)

Sunburst (Mont.)	1.35
Artesia (March 12)	1.00
Hogback (N. Mex.) (March 14)	1.35

Note: Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

EASTERN STATES
Joseph Seep Purchasing Agency
(Effective December 17)

Penna Grade Oil in New York Transit Line (New York)	$2.80
Bradford District Oil in National Transit Lines (Pennsylvania)	2.80
Penna Grade Oil in National Transit Lines (Pennsylvania)	2.65
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	2.65
Penna Grade Oil in Eureka Pipe Line lines (Pennsylvania)	2.60
Penna Grade Oil in Buckeye Pipe Line lines (Ohio)	2.85
Cabell Grade Oil in Eureka Pipe Line lines (West Virginia) (December 4)	1.80
Corning 35-cent grade oil in Buckeye Pipe Line Co.'s line (December 19)	1.45
Corning 25-cent grade oil in Buckeye Pipe Line Co.'s lines (December 19)	1.55
Somerset Oil in Cumberland Pipe Line lines (Kentucky) (December 4)	1.80
Ragland Grade Oil in Cumberland Pipe Line lines (Kentucky) (August 1)	.95
Keister (Pennsylvania) (August 1)	1.10

MIDDLE WESTERN STATES
Ohio Oil Co.
(Effective March 14)

Lima	$1.71
Wooster	1.67
Illinois	1.60
Indiana	1.48
Princeton	1.60
Plymouth	1.38
Waterloo (Nov. 17, 1926)	1.35
*Western Kentucky	1.33
**Saginaw, Mich., Saginaw Sand (May 27)	2.05
**Saginaw, Mich., Berea Sand (May 27)	1.96
†Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky (March 16)	1.50
‡Oil in lines of Stoll Oil Refining Co. in Oil City, Ky. (March 16, 1927)	1.50
§Oil Springs (Canada)	2.18
§Petrolia (Canada)	2.11

*Posted by Ohio Oil Co.
†Posted by Paragon Development Co.
‡Posted by Stoll Oil Refining Co.
§Posted by Imperial Oil Co., Ltd.
**Posted by Sun Oil Co.

MEXICAN CRUDE

Note—Due to the fact that the exportation of Tuxpam light crude oil has become a negligible factor, prices will no longer be published.

*Panuco heavy (f.o.b. Mex. ports)	$1.15

*17.496 cents tax.

This SIGN invites the careful motorist into your station!

THE meaning of this sign is becoming more and more widely known to alert and careful motorists. When they see it on your station they *know* that you are a Dealer who not merely sells oil, but *gives correct lubrication.*

The Dealer who shows this Sign asks the man who drives in for oil—*"What is the mileage on your speedometer?"* Then he consults the Sinclair Recommendation Index and gives the motorist exactly the right grade of Opaline to fit the degree of wear in the car's engine and *seal* its power!

May we tell you about this successful method of selling *correct lubrication* with the full line of Opaline Motor Oils?

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SINCLAIR OPALINE MOTOR OIL

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Seals Power at every Degree of Wear

Oil Securities Were Uniformly Strong

Acted Counter to Movement of General Market, Reflecting Signs of Improvement in Industry's Conditions

The oil securities were uniformly strong last week, and acted counter to the general market which showed symptoms of softness. The oils are entitled to run counter to the general market when it makes downward swings at this time because the industrial conditions which govern oil show signs of improvement. Last year when the spectacular bull market was in full swing, the oiis dropped severely, and it is not surprising that now when they have started their recovery the general list fails to lower them.

Marland, Independent and Sun oil stocks featured the list last week.

Indian Refining Financing

Bond & Goodwin and Freeman & Co. of New York are offering a new issue of $1,600,000 5½ per cent first mortgage serial gold bonds of the Indian Refining Co. Proceeds from the sale of the bonds will be used to reimburse the company for capital expenditures, to retire outstanding current indebtedness and for other corporate purposes. The bonds are offered at prices yielding from 5.50 per cent to 6 per cent, depending upon maturity.

The bonds are to be secured by a closed first mortgage on the refinery property of the company at Lawrenceville, Ill., which was appraised as of December 17, 1927, at over $7,200,000 net sound value, according to the statement of Dr. Frank Fritts, vice president of the Indian Refining Co. The consolidated balance sheet of the company and its subsidiaries, as of October 31, 1927, and adjusted to give effect to this financing, indicated net tangible assets of $13,565,767; net current assets amounted to $2,652,610.

For the three years and 10 months ended October 31, 1927, net sales of the company and subsidiary companies averaged $21,389,831 annually, and for the 10 months ended October 31, 1927, were $16,368,721. Net operating earnings for the same period, available for interest, depreciation and Federal taxes, averaged $1,205,367, and for the 10 months ended October 31, 1927, were $971,707. Annual interest charges on the consolidated funded debt to be outstanding on the completion of this financing are calculated at less than $230,000.

Pan American Petroleum

Reports are to the effect that the Pan American Petroleum & Transport Co. may take advantage of prevailing low money rates by coming into the public market for additional funds to take care of a part, at least, of its expansion requirements. Currently, Pan American is said to be using part of its bank credit, borrowings being estimated at about $7,000,000.

Cortez Oil

The petition of the Cortez Oil Co. for an income tax refund of $102,893 from the Federal Government has been denied by the United States Court of Claims, according to a report from Washington. The case involved the taxability of income from restricted Indian lands and a question of the exclusion from consolidated invested capital of $826,422 by the oil corporation.

All claims of the Cortez company were rejected by the Bureau of Internal Revenue, its position having been upheld by the court.

New York Oil

The Midwest Refining Co. has purchased from the New York Oil Co. the latter's royalty and working intersts in the Salt Creek Field of Wyoming. Actual transfer will take place in about three months. The transaction is conditional, and is based on certain showings, made while negotiations were under way, which remain to be checked. If these accountings do not come up to certain requirements, the Midwest Refining interests will be released from obligations to purchase, but if the transfer is completed, the Midwest Oil Co., acting for Salt Creek producers, will purchase substantial properties under contract.

The Empire State Oil Co., controlled by interests affiliated with the New York Oil Co., will take over oil properties outside of the Salt Creek Field and the New York Oil Co. will continue as a public utility, operating its gas properties. The New York Oil Co. has varying interests in 4,560 acres, upon which are 633 wells.

Reiter-Foster Oil

The Reiter-Foster Oil Corp. reports as of December 31, 1927, total assets of $5,615,862 and profit and loss surplus of $2,844,724. Current assets were $191,223 and current liabilities, including the supply company notes, payable this year, were $47,127.

The balance sheet as of December 31, 1927, follows:

Assets: Leaseholds, equipment, fixtures, etc., less depreciation, $4,733,135; prepaid expenses, $851; stocks in other companies (minority interest), $123,517; cash, $66,444; accounts and notes receivable, $38,835; warehouse stocks, $85,945; deferred accounts receivable, $567,135; total, $5,615,862.

Liabilities: Capital stock represented by 265,607 no par value shares and 117,977 no par value shares sold but unissued, making a total of 383,584 no par value shares, $2,724,010; accounts payable, $13,921; Supply company note (due January 15, 1928), $5,000; Supply company notes (Due $5,000 per month after January 15, 1928), $28,207; surplus, $2,844,724; total, $5,615,862.

Cities Service Pipe Line

The Cities Service gas pipe line from Pampa, Tex., to Wichita, Kans., a distance of 250 miles, is being financed in part with the proceeds of an issue of $12,000,000 Cities Service Gas Pipe Line Co. first mortgage pipe line 6 per cent bonds, which has been sold to Halsey, Stuart & Co., Hallgarten & Co., and associates.

Royal Dutch Dividend

The recent dividend of 10 per cent declared by the Royal Dutch company is equivalent to $1.34 3/10 on each New York share and will be payable January 28 to stockholders of record January 16.

Williams Oil-O-Matic

Gilbert Geoger has been elected an additional director of the Williams Oil-O-Matic Heating Corp. Other directors were re-elected.

Standard Oil of Nebraska

At the annual meeting of the Standard Oil Co. of Nebraska directors were re-elected. At the subsequent meeting of directors officers were re-elected.

Northern Pipe Line Co.

The Stockholders' Protective Committee of the Northern Pipe Line Co., which is seeking to bring about distribution of part of the company's cash assets, has sent a reply to the answer of the Northern Pipe Line Co. officials to the committee's original letter. The reply asks for additional proxies and says in part:

"The committee has met with a very hearty response to its letter of December 27 from the stockholders and has already in hand and under commitment, proxies which are sufficient to elect two of the five directors to be chosen at the annual meeting on January 19 next. With the further and continued support of the stockholders, the committee hopes to make their wishes even more effectively felt."

The directors of Northern Pipe Line Co. contend that the cash assets are needed as a reserve in connection with further development of the company.

NEW YORK STOCK EXCHANGE—LIST OF ACTIVE STOCKS

Stocks—	Par	Clos. Quot. Jan.16	Clos. Quot. Jan.9	1927 High	1927 Low	1926 High	1926 Low	1925 High	1925 Low
Amerada Corp.	..	31⅜	32½	37⅛	27⅝	32⅞	24¾	..	..
Atlantic Refining, com.	100	108½	105½	131⅜	107	128⅜	97	117½	95½
Barnsdall "A"	25	25⅛	25	35½	20⅜	32½	23½	33½	18¾
California Petroleum, com.	25	25	25⅞	32⅞	20	38⅛	30⅞	34⅜	23⅜
Houston Oil	100	150	150	175¾	60⅛	75	50¼	85	50
Independent Oil & Gas	..	26⅝	27¾	32⅜	17⅝	34	20¼	41⅜	13½
Louisiana Oil	10	12⅛	12½	18⅛	10½	19⅝	12	23⅜	13¾
Maracaibo	..	17⅛	15¾	22⅜	12	27⅜	18⅝	35½	20¾
Marland	..	38	35⅝	58⅛	31	63⅜	41¼	60⅛	31⅝
Mid-Continent Petroleum	..	29¼	28⅝	39⅜	25½	41	25⅝	38	25¾
National Supply	50	93½	94	95¾	76	84⅞	55½	71	54¾
Oil Well Supply	25	35⅝	36⅞	44⅜	31¼	36	30	38	33⅜
Pan American, B	50	44	43¾	66⅜	45½	72⅜	56⅛	83⅞	59½
Pan American, Western B	..	20	20⅜	37⅞	16⅜	46	34	94⅜	37¼
Phillips Petroleum	..	43	41¼	60½	36½	54⅞	42½	47⅛	47¼
Producers & Refiners	50	25	25	33⅞	16⅜	26	11	32⅝	12½
Pure Oil, com.	..	26¼	26⅝	33½	25	31	25⅜	33⅜	32½
Royal Dutch, N. Y., sh.	13.40	46½	48	54½	44¼	57⅜	49⅜	57⅜	48¼
Shell Transport	10	42⅞	41⅝	49	41½	48⅞	42	49	30⅜
Shell Union, com.	..	26½	26¼	31⅜	24⅝	30⅞	24	28⅜	21⅝
Simms Petroleum	10	23	23⅞	23⅞	14¼	25⅝	16½	28½	18¾
Sinclair Consolidated	..	20⅜	20⅝	22⅝	15½	24⅞	16⅜	24⅞	17
Skelly Oil	25	27½	27	37⅝	24¼	37½	27	32½	21⅜
Standard of California	25	55⅝	55½	60⅜	50⅜	63⅛	54	67¼	52⅛
Standard of New Jersey, com.	25	40	40⅛	41⅜	35⅛	46⅝	37½	47½	38⅝
Standard of New York	25	30⅞	30⅞	34⅛	29¾	47¼	30⅝	48⅝	40
Sun Oil Co.	..	35	31½	34⅞	30	41¼	30½	43⅞	38½
The Texas Company	25	54⅜	54⅛	58	45	58	48	55	43¾
Texas Pacific Coal & Oil	10	16¼	14½	18⅞	12	19½	12½	23¼	11
Tide Water Associated Oil	..	16⅜	16½	19⅛	15⅜	21	17	..	..
Transcontinental	..	9	8⅝	10⅜	3⅜	5½	3	5⅝	3⅛
Union Oil of California	25	44½	44½	56½	39⅜	53⅜	37¼	43⅝	38½
Union Tank, com.	100	122	122	126	94	120⅜	84¼	‡134	118
White Eagle Oil & Refining	..	22	23½	27½	21⅜	29⅜	25½	28¾	25⅝
Standard Oils									
Anglo-American Oil	£1	20¼	18½	21⅝	17½	19¾	16½	26¾	17½
Borne Scrymser	25	54	56	69	49½	78	65	‡240	205
Buckeye Pipe Line	50	58½	58½	59	45	59½	42	72	63½
Chesebrough Manufacturing Co.	25	138	120	126	76½	81½	63	74	48¼
Continental	10	21⅞	22¼	22⅝	16¼	25⅞	10¼	31½	21⅞
Cumberland Pipe Line	100	93	91	‡137	90	137	102	156	128
Eureka Pipe Line	100	66	63	66	47	43¾	43	96	61¼
Galena Signal, com.	100	5½	6	13½	4½	32½	9⅞	68½	23½
Humble Oil & Refining Co.	25	65⅝	66⅜	67¾	54	99⅝	52	99	40½
Illinois Pipe Line	100	180	180	181½	123¾	144	131	154½	124
Imperial Oil	..	62¾	59⅝	64¾	37¾	39⅝	32½	39¼	27¼
Indiana Pipe Line	50	78	76	93	61	68	52¼	84	57½
International Petroleum Co.	10	41	37½	36⅜	28¼	35¼	28⅜	25⅜	20⅛
National Transit Co.	12.50	21	22	23¼	13¼	30⅜	27¼	25½	16½
New York Transit	100	39	39	42	31¼	61½	27¼	70	50
Northern Pipe Line	100	96	96	96	70	80½	64	88	67½
Ohio Oil Co.	25	65¼	65¼	66	52	67¾	55¾	75¼	60
Penn-Mex Fuel	25	39¼	38½	36½	12	24¼	15	44	19
Prairie Oil & Gas	25	50	49	55½	45⅝	60¼	49	65½	45⅞
Prairie Pipe Line	100	185⅜	185	189¼	132	137½	122½	129¾	105
Solar Refining Co.	100	175	176	‡201½	178	212	184½	259	200
South Penn Oil	25	38	37	41⅜	34½	50	30	‡197	139
Southwest Pa. Line	100	78	71	78	55½	56	47½	84	50
Southern Pipe Line	50	21	20	39	18½	27	34	‡103	63
Standard of Indiana	25	78¾	80½	80¾	64⅝	70½	60½	70⅝	69¼
Standard of Kansas	25	16¾	16⅝	20⅞	15⅝	36½	16½	45	30
Standard of Kentucky	25	128	129⅜	125¼	111½	134⅜	107	137	114⅜
Standard of Nebraska	25	41½	41½	49½	43	51⅛	42	‡270	231
Standard of Ohio, com.	100	75⅜	77½	81½	72	362	192⅛	369	338
Swan & Finch, com.	25	17½	17½	21	14½	21	18	27	12
Vacuum Oil	25	145½	141	147	95⅛	109⅜	94⅛	109½	80½
Miscellaneous									
Gulf Oil Corp. of Pa.	25	112½	114⅜	116	86¼	95	82½	98¼	63½

*Bid, no sales. ‡Old stock. †New stock. §Ex-dividend.

Quotations furnished by W. J. Wollman & Co.

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange was as follows:

Jan. 16	63.87	Dec. 12	62.07	Nov. 7	61.30
Jan. 9	63.55	Dec. 3	62.06	Oct. 31	59.98
Dec. 31	62.09	Nov. 28	62.32	Oct. 24	60.45
Dec. 27	62.86	Nov. 21	62.66	Oct. 17	59.22
Dec. 19	63.24	Nov. 14	62.78	Oct. 10	59.20

LUB EXPORTS FEATURE GULF COAST MARKETS

HOUSTON, Tex., Jan. 16.—Export movement of lubricating oils featured Gulf Coast markets the past week. Several cargoes already have been shipped and from four to five cargoes are expected to be moved abroad within the next few weeks. The export business, while being done at prices substantially below the prevailing spot market for domestic movement will furnish considerable relief for Gulf Coast refiners.

The domestic market was unchanged the past week with a continuation of the fair demand enjoyed for the past several weeks. Firm advances in Gulf Coast quotations still are hampered to a large extent by competition of outside material, but further increases in the volume of business will tend to eliminate offerings for cheaper oils.

Fuel oil markets were unchanged during the week but with a number of important refineries and other industries along the Houston ship channel changing from natural gas to oil for fuel, strengthening of the market might be expected. Humble Oil & Refining Co., the past week announced it was reducing its gas consumption to a minimum and is increasing the use of fuel oil. This is made possible, it is claimed, due to the fact that fuel oil at the present market is less expensive than gas.

DOHERTY PURCHASES ARKANSAS GAS COS.

NEW YORK, Jan. 17.—Henry L. Doherty & Co. have acquired the Arkansas Natural Gas Co. and the gas properties of the Southwestern Gas & Electric Co. These two properties will be consolidated with other Cities Service properties, including the Natural Gas & Fuel Corp. and Industrial Gas Co. The new properties have 1,000 miles of distributing and gathering system having gas sales of 23,000,000,000 feet in 1927.

JOINS TRANSCONTINENTAL

CHICAGO, Jan. 14.—A. J. Slater, Jr., has joined the staff at the Chicago office of the Transcontinental Oil Co., and will be active in the sales end. Mr. Slater is the son of A. J. Slater, general superintendent of the Transcontinental refineries, and comes from the Tulsa office.

GULF COAST FIELDS

(Continued from Page 48)

duction Co.'s No. 4 Blakely is drilling around 900 feet. Gordon, Folwell & Dickson have resumed drilling in No. 3 Blakely. This test is the one which blew out several weeks ago while drilling at 2,400 feet. A new derrick and rig have been set up and the test now is down 2,600 feet. Gordon & Sharp have a rig up for No. 2 Blakely. Gulf Production Co. is drilling at 4,116 feet in No. 11, West Schenck. This company also has a location for No. 11 Luscher. Navarro Oil Co.'s No. 1-B Robinson is drilling below 3,350 feet. This company also has a location for No. 4-B Robinson and is deepening No. 1-A Robinson, an old well, being down around 3,350 feet. No. 4-A Robinson is drilling around 3,000 feet. Sam Watts and associates' No. 2 Blakely is drilling below 1,800 feet.

At Moore's Field (Orchard), Gulf Production Co.'s No. 14 Moore is drilling below 3,700 feet.

Gulf's No. 34 Davis at Big Creek is drilling at 2,986 feet. This company's No. 44 Davis is down 3,980 feet. The Texas Company's No. 3 Wheat is drilling below 3,200 feet.

At Dewalt, Fort Bend County, Humble Oil & Refining Co.'s No. 1 Sugar Land is drilling at 1,080 feet.

At Nash Dome, Rycade Oil Corp.'s No. 18 Wisdom blew out during the week at 3,998 feet. It was making an estimated 30,000,000 feet of dry gas but bridged over. The bridge now has been drilled out and the test is coring. This company's No. 20 Wisdom is drilling in sand at 4,160 feet, but showing no oil. No. 21 Wisdom is drilling in a water sand at 3,926 feet. No. 22 Wisdom has been rigged up and now is drilling at 565 feet.

On the Fort Bend County side of the Boling Dome (Fort Bend-Wharton Counties) Sun Oil Co. has abandoned No. 3 H. R. Farmer in gyp and sulphur at 1,145 feet. This company already has rigged up for No. 4 H. R. Farmer and No. 5 J. R. Farmer.

Hardin County

At Batson, Deutser Oil Co. has encountered salt water at 1,150 feet in its No. 1 Colorado-Batson Syndicate. Gulf Production Co.'s No. 13 Tabor at Saratoga is drilling at 1,760 feet. Rio Bravo Oil Co.'s No. 104 "D" at Saratoga was abandoned during the week at 2,030 feet. Sun Oil Co.'s No. 137 M. & M. hit salt water at 2,130 feet and has been shut down.

Orange Petroleum Co.'s No. 4 Merchant, Sour Lake, also was abandoned. This test was on the south edge of the dome and hit the salt at 4,860 feet. Gulf Production Co.'s No. 3 Thomson at Sour Lake is drilling at 2,150 feet.

Harris County

Three wells were completed at Goose Creek, Harris County, two by Gulf Production Co. and one by Humble Oil & Refining Co. Gulf's No. 18 Hoffman-Gaillard is making 150 bbls. from sand at 2,803 feet and its No. 21-A Wright 25 bbls. at 3,035 feet. Humble's No. 4 Ashbel-Smith is flowing 175 bbls. from sand at 2,880 feet. All three are old wells deepened.

Humble's No. 73 Simms-Smith at Goose Creek cored a water sand without a showing of oil at 4,408 feet. No. 10 Sweet is standing after failure to complete a fishing job preparatory to deepening. Port City Oil Co.'s No. 1 Grace Addey is drilling below 2,140 feet.

At Pierce Junction, Rio Bravo Oil Co.'s No. 7 P. S. A. came in flowing 1,450 bbls. from sand at 4,225 feet. Gulf Production Co.'s No. 22 Taylor also came in during the week flowing at the rate of 1,000 bbls. daily from sand at a total depth of 4,022 feet. Saturday the latter had dropped off to 15 bbls. hourly and was to be cleaned out in an effort to restore its initial production. Navarro Oil Co.'s No. 2-A Cain also blew in making around 1,000 bbls. daily. This is an old well which was being worked over a second time. It was worked over and deepened to 4,875 feet last August and came in for 2,400 bbls. at that time, later sanding up.

Anderson & Plummer's No. 2 Whitehead at Pierce Junction is drilling at 3,440 feet. Cullen and associates' No. 4 Howe is drilling at 4,350 feet. Gulf Production Co. has a rig up for No. 1 San Jacinto Bay and is drilling at 3,998 feet in No. 23 Taylor. Hutex Oil Co.'s No. 1 Traper is drilling below 3,050 feet. Leonard and associates' No. 1 Settegast is down 2,355 feet. Moody Corp.'s No. 3 Hume is below 3,000 feet and No. 2 Whitehead is down 2,150 feet. The same company's No. 1 Cooper is drilling below 2,350 feet. Navarro Oil Co.'s No. 2-B Cain is drilling around 4,115 feet. Rio Bravo Oil Co.'s No. 3 G. H. & S. A. is drilling at 2,350 feet, its No. 101 G. H. & S. A. at 4,775 feet and its No. 7-B Settegast is down 3,100 feet. Rio Bravo also is making arrangements to deepen another old well, the No. 1 Settegast.

Griffith and associates have made a location for a wildcat northeast of Houston. This will be No. 1 Griffith. Humble Oil & Refining Co.'s No. 2 Warren at Hockley is drilling in a sand at 3,941 feet. The sand failed to show an oil.

Jefferson County

At Spindletop, Yount Lee Oil Co. has completed No. 49 Gladys City, flowing 800 bbls. of pipe line oil from sand at 3,327 feet, and also its No. 48 McFaddin, flowing 465 bbls. from sand at 3,076 feet. The wells were completed earlier in the month, but were not reported until the past week.

Gulf Production Co. is fishing liner at 4,650 feet in No. 10-A McLean. Total depth of the hole is 5,382 feet. No. 17 McLean is down 4,900 feet, and No. 18 McLean 4,450 feet. Gulf's No. 7 Jack & Duff is drilling at 4,820 feet and No. 8 Jack & Duff at 2,850 feet. Magnolia Petroleum Co.'s No. 7-A fee is drilling below 5,030 feet. Rio Bravo Oil Co. is making arrangements to deepen its No. 54 T. & N. O. Sun Oil Co.'s No. 1 Coit is drilling at 4,200 feet. This company's No. 11 McLean is drilling at 5,340 feet. No. 18 McLean is down 4,875 feet and No. 17, an old well being deepened, is drilling at 4,900 feet. No. 19 McLean is drilling around 4,700 feet. Yount Lee Oil Co. has staked a location for No. 52 Gladys City.

Five miles north of Port Arthur, McMurry and associates have staked a location and have rigged up for No. 2 Crosby. No. 1 Crosby was abandoned two weeks ago at 4,025 feet.

Liberty County

At Hull, Gulf Production Co. has completed No. 48 Phoenix, an old well deepened to 3,318 feet. It came in flowing 500 bbls. of oil. This company, however, abandoned No. 87 Phoenix, encountering salt water at 5,260 feet. It has locations for Nos. 88 and 89 Phoenix and is deepening No. 48, an old well. No. 11 Thomas, also at Hull, is drilling at 3,160 feet. Republic Production Co. also abandoned a Hull well, its No. 89 Dolbear, which was dry at 4,010 feet. This is an old well. No. 94 Dolbear is to be deepened. W. F. Flynn is drilling at 2,015 feet in No. 1 Ray, but Humble Oil & Refining Co.'s No. 1 Hooks-Bell was dry at 2,900 feet. Navarro Oil Co. is drilling at 2,875 feet in No. 3 Harrison. Republic Production Co.'s No. 23 Dolbear is drilling around 2,225 feet. The Texas Company-Vacuum Oil Co.'s No. 7 Hannah is drilling sticky shale at 4,130 feet.

The Texas Company has made a location for No. 1 Green at Liberty and is building a road to the location. Yount Lee Oil Co.'s No. 1 Mitchell at Liberty is in a sand at 2,790 feet.

Matagorda County

Gulf Production Co. has staked a location for No. 5 Sanborn at Hawkinsville and is building a derrick. At Markham, Rycade Oil Corp. and Humbls Oil & Refining Co. are building a standard rig to pump No. 5 Kountze. This test has a sand at 3,872 feet.

Montgomery County

Brains and associates have abandoned No. 1 Fitch, 3 miles northwest of Spring, Montgomery County.

Orange County

Sinclair Oil & Gas Co. completed No. 5 Granger at Orange the past week, flowing 4,000 bbls. of pipe line oil from sand at 3,960 feet. This is an old well worked over and deepened to its present level. Brownie-Babbette Oil Co. also is setting strainer at 3,325 feet to test its No. 1 Mclean. Gulf Production Co. is drilling at 4,227 feet in No. 21 Lee Hager fee and at 3,300 feet in No. 1 Hager & Moore. Humble Oil & Refining Co. is reaming to set screen in No. 1 Kishi Lang. It had a showing of oil in sand at 3,171 feet. Rex Petroleum Corp. is to put No. 6 Carbello on the pump at 3,160 feet. Rycade Oil Corp. also is preparing to test No. 13-E State on Cow Bayou. Sun Oil Co.'s No. 2 Brown is drilling at 5,040 feet. Texhoma Oil Co. is making arrangements to deepen No. 8 Chessom.

Wharton County

Southern Exploration Co.'s No. 1 Mullins, a deep test at Boling, is drilling around 3,270 feet.

LOUISIANA GULF COAST

Acadia Parish

At Evangeline, Cline, Smith & Cline have set strainer and are bailing No. 2 Lucy Wilson at 1,780 feet. The Texas Company's No. 2 Rayne heirs on the south edge of the dome is drilling at 4,140 feet. This company's No. 4-B Latrielle is drilling around 500 feet.

Calcasieu Parish

At Edgerly, Edgerly Petroleum Co. encountered salt water at 3,475 feet in No. 11 Vincent. Green Oil Co.'s No. 9 Moore is drilling at 3,150 feet. J. D. Sutton and associates are to deepen No. 1 after hitting salt water at 3,725 feet. Wilson-Broach are drilling around 3,560 feet in No. 6 Wilson.

Gulf Refining Co. has a rig up for No. 44 Star-Vincent at Vinton. Vinton Petroleum Co.'s No. 9 Gordon is drilling at 2,915 feet. The latter company also has made a location for No. 61 Gray.

At Starks Dome, Gulf Refining Co. is drilling at 4,050 feet in No. 9 Industrial and in No. 8 Lutcher-Moore it is down below 1,300 feet.

Vacuum Oil Co. and Gulf Refining Co. at Lockport are drilling at 4,347 feet in No. 3 Farquahar. This test originally was drilled to 4,400 feet but was sidetracked at 4,296 feet. In No. 3-A Farquahar, which came in a week ago flowing 1,300 bbls. of fluid, 45 per cent water, an attempt was made to run in 2½-inch tubing, but the tubing catcher hung up at 3,000 feet. The well was flowing from sand at 4,413 feet. No. 5 Farquahar is shut down temporarily. No. 4 State on Bayou D'Inde is preparing to mud up and will fish for lost screen at 4,423 feet. No. A-1 fee is drilling sandy shale at 4,603 feet. No. 2 Frieber & Woolf is drilling water sand at 6,044 feet.

Between Lockport and Lake Charles, Newton Drilling Co.'s No. 1 Dupre has been shut down temporarily below 2,800 feet. Union Sulphur Co. at Sulphur has cleaned out the hole in No. 719 fee at 3,610 feet and is ready to deepen.

Cameron Parish

At East Hackberry, Calcasieu Oil Co. has set 6⅝-inch casing at 3,952 feet in No. 1 Olevia and will drill plug the early part of the week. This company's No. 1 Watkins is down 2,300 feet. A derrick has been completed for No. 1 Dorion. C. O. Noble and associates are drilling around 2,700 feet in No. 1 Ellender.

Pure Oil Co.'s No. 4 Sweet Lake at Sweet Lake drilled hard sand at 5,485 feet and No. 5 Sweet Lake went through gumbo and lime at 5,480 feet.

In the Old Hackberry district, Yount Lee Oil Co.'s No. 7 School Land is drilling around 3,500 feet.

Miscellaneous

At Pine Prairie, Evangeline Parish, Tom Hincy and associates are drilling lime at 2,430 feet. Eunice Welch Oil Co.'s No. 1 Welch, Chacahoula Dome, Jeff Davis Parish, is being put on the pump at 1,240 feet. Jefferson Oil & Development Co.'s No. 2 Salt Mine at Jefferson Island, Iberia Parish, is drilling below 1,200 feet. Roxana Petroleum Corp. is connecting flow line and will set screen in No. 1 Wilbert, White Castle, Iberville Parish, where it has a good looking sand at 1,580-89 feet. Total depth of the hole is 1,593 feet in blue shale. Union Sulphur Co.'s No. 1 Wilbert, Bayou Des Glais Dome, Iberville Parish, is drilling around 1,000 feet. On the Bayou Blue Dome, Iberville Parish, Union Sulphur Co.'s No. 1 Schwing is drilling gumbo below 1,500 feet. Rycade Oil Corp.'s No. 2 Atchafalaya, St. Martin's Parish, is drilling sand and gravel at 529 feet. No. 1 still is fishing at 3,916 feet. Southern Gas Co.'s No. 4 Southdown, Terrebonne Parish, is drilling sand and shale at 1,330 feet.

OKLAHOMA FIELDS

(Continued from Page 132)

Section 8-16-14, is dry and abandoned in the Wilcox sand at 1,987-92 feet.

Pottawatomie County

Amerada Petroleum Corp. is building the rig for No. 1 Gravel, SW cor. SE NE, Section 1-8-4. Gypsy Oil Co. has the rig on the ground for No. 2 Cecil, NW cor. SW NE, Section 19-7-4. Pearson Pool. No. 1 Cecil, SW cor. NE, Section 19-7-4, flowed 720 bbls. from the Hunton lime at 3,791-3,840 feet.

Wagoner County

Elk Drilling Co. has a machine on the location for No. 1 Norfer, NE cor. Section 23-18-15. H. C. Deems' No. 10 Sarty, SW cor. NE SW, Section 31-18-15, is drilling at 700 feet. J. Striker's No. 2 Prince, NE cor. SW SW, Section 29-18-16, is drilling at 783 feet.

F. R. Winters' No. 1 Lynch, SW cor. NW NW, Section 11-19-15, is dry and abandoned at 1,180 feet. Bu-Vi-Bar Petroleum Corp.'s No. 2 McHenry, CWL NW SW, Section 29-18-15, has been completed for 15 bbls. in sand at 1,237-57 feet. No. 3 McHenry, C NW SW, Section 29-18-15, is a 20-bbl. well in sand at 1,225-57 feet.

STORAGE IN WEST TEXAS AND PIPE LINE RECEIPTS

(Continued from Page 34)

Upton County	499,459
Winkler County	1,747,339
	7,863,687

Tank Car Shipments

West Texas tank car shipments totaled 1,259,726 bbls. in December. Shipments by companies showing their destinations is shown as follows:

Company—	From Upton	From Ward	To
Southern Pipe Line Co.	11,622	.....	Pecos Valley P. & L. Co., Girvin, Tex.
Southern Pipe Line Co.	22,119	.....	Sunflower Pet. Co., Texas City, Tex.
Southern Pipe Line Co.	10,068	.....	H. H. Cross, Chicago, Ill.
Southern Pipe Line Co.	1,210	.....	Brownfield & Compton, El Paso, Tex.
Southern Pipe Line Co.	2,829	.....	Miscellaneous companies
Southern Pipe Line Co.	.....	53,429	Standard of Indiana, Sugar Creek, Mo.
Southern Pipe Line Co.	.....	53,237	Standard of Indiana, Woodriver, Ind.
Southern Pipe Line Co.	.....	129,060	Standard of Indiana, Whitney, Ind.
Southern Pipe Line Co.	.....	962	Star Refining Co., Fort Worth, Tex.
Southern Pipe Line Co.	.....	42,087	Chalmette Pet. Corp., New Orleans, La.
Southern Pipe Line Co.	.....	60,691	Liberty Oil Co., Gouldsboro, La.
Southern Pipe Line Co.	.....	60,116	La. Oil & Ref. Corp., New Orleans, La.
Texas Pipe Line Co.	57,093	.....	The Texas Company, Port Arthur, Tex.
Humble Pipe Line Co., From Jones County	.....	40,000	Simms Oil Co., Dallas, Tex.
Big Lake Oil Co., From Reagan County	.....	64,000	Rio Grande Ref. Co., El Paso, Tex.
Humble Pipe Line Co., From Runnels County	.....	2,600	Humble O. & R. Co., Texas City, Tex.

CUTS WERE TRANSPOSED

Two cuts showing Axelson sucker rods in the Axelson Machine Co.'s advertisement in the January 5 issue of The Oil and Gas Journal were transposed through error. The Axelson A.P.I. specification rod was shown as the Axelson standard rod and vice versa. The advertisement, with the illustrations in their proper positions, is shown on page 117 of this issue.

FEDERAL OIL BOARD WARNS OIL INDUSTRY

(Continued from Page 31)

ducted at a profit. In the meantime, however, experimental and development work might well be continued, so that when shale oil is needed the information will be available as to the best methods to follow in retorting the shale and refining the shale oil.

Coal

Other important sources of oil are the coal and lignite deposits of this country. It has been estimated that the reserves of bituminous, subbituminous, and semibituminous coal in the United States, within 3,000 feet of the surface, amount to nearly 2,500,000,000,000 bbls. of motor fuel. This is more than 300 times the production of motor fuel for the year 1927. It should not be considered, however, that all this coal could be made available at present prices, since some of the deposits are far removed from the railroads and in many places the beds are too thin or too deep to be worked under present conditions. It has been estimated that the lignite deposits of the country amount to 940,000,000,000 tons capable of yielding 12,000,000,000 bbls. of motor fuel.

Coal offers certain advantages over oil shale as a future source of oil. The deposits are more widely distributed, some of the largest being near important marketing centers. The residue from the distillation of coal is a valuable fuel, while, on the basis of present information, spent shale is practically worthless and its disposal means an additional expense to the cost of producing shale oil. On the other hand, the oil shale deposits are much thicker than the coal deposits, and for that reason the cost of mining would doubtless be less, except in places where coal can be mined with steam shovels. The yield of oil from shale would doubtless be higher than from coal under retorting methods that are now in commercial use, and the cost of extracting it would possibly be less. If coal can be liquefied commercially, the yield of oil will be much higher than could be obtained from oil shale.

Production of Benzol

The production of benzol in 1926 amounted to approximately 90,000,000 gallons, which is less than 1 per cent of the gasoline production for the same year. A considerable portion of the benzol output was used for motor fuel in the form of blends with gasoline. All this output came from the high temperature distillation of coal, the yield amounting to 3 to 4 gallons of light oil per ton. If the entire production of bituminous coal had been distilled, the yield of motor fuel would have amounted to only a small percentage of the motor fuel requirement of the country. Some experimental plants for the low-temperature carbonization of coal have been built in this country, but this process is not in commercial use at the present time. It is obvious that distillation processes could not be operated for oil production alone, but must depend upon the market for the major products —that is, coke and gas. Since the market for those products is somewhat limited, other processes in which motor fuel is the principal product may offer a better solution of the problem of supplying motor fuel from coal in quantities comparable with the production from petroleum.

Liquefying Coal

A process for liquefying coal by heating it in an atmosphere of hydrogen has been operated on an experimental scale in Germany for several years and is now being tried out on a commercial scale. This process produces from 93 to 133 gallons of liquid fuel from a ton of coal from which about 40 gallons of motor fuel is obtained, or nearly 1 bbl. to the ton.

The production of fuels such as methanol and synthol by the complete gasification of coal also offers promise as a future source of motor fuels. Laboratory experiments have demonstrated that good yields of liquid fuels can be obtained by heating together carbon monoxide and hydrogen in the presence of a suitable catalyst, and there has been commercial production in Germany. The products manufactured in this way can be used as motor fuels in the present type of engine but could be more efficiently utilized in high-compression engines. The chief advantage of this method of manufacturing motor fuels from coal or coke is that there would not be the problem of disposing of solid fuels, and they could be furnished at a price in any desired quantity.

A discussion by A. C. Fieldner, chief chemist of the Bureau of Mines, of the processes for obtaining motor fuel from coal is given in Appendix 3.

The possibility that coal will be the source first to be drawn upon for supplementing the petroleum supply leads this board to unite with the Naval Oil Reserve Commission in recommending the creation of two reserves of coal available for this special purpose. It is recognized that oil won from oil shale or coal will not be labor cheap like the petroleum now flowing from our wells and that in time of war a nation's industry is short handed. For this reason any reserve of raw material for national defense should be both strategically located and otherwise adapted to conserve man power.

The proposed reserves to be recommended for executive withdrawal include some 4,000 acres of publicly owned coal deposits in Wyoming and Montana, with an estimated content of 250,000,000 tons of subbituminous coal from which 80,000,000 bbls. of oil could be produced. These reserves are selected because the tracts are close to railway lines so that track extensions would involve no delay, and the coal is near the surface so that it can be mined by stripping operations and expeditiously brought into production, with an output per miner tenfold that of underground workings. The extremely low operating costs and the facility with which these reserves could be developed are definitely known from commercial practice in the same areas.

Alcohol

The utilization of agricultural products in providing substitute motor fuels hinges on the two economic problems of supply and price. The report from the Bureau of Chemistry of the Department of Agriculture (Appendix 4) sets forth the facts bearing upon the subject, and the conclusions that necessarily follow from that discussion are as follows:

Among the agricultural products, corn and molasses alone promise any approach to commercial possibilities. As to adequacy of such sources of supply, it may be noted that the world's total production of cane sugar in 1926 could have supplied only enough by-product molasses to yield 250,000,000 gallons of industrial alcohol, which is the equivalent of less than 2 per cent of that year's consumption of gasoline in the United States.

Corn, our cheapest cereal, is the raw material that might be thought to promise most in furnishing a domestic source of substitute motor fuel. What part of the present yield of corn could be considered available and what added acreages could be made available are wholly matters of conjecture, but it may be enlightening to note that if the entire corn crop of 1926 had been converted into industrial alcohol it would have yielded about 6,500,000,000 gallons, which would have supplied considerably less than half (44 per cent) of the year's consumption of motor fuel. If corn were to furnish the only substitute for the gasoline we now use, two-thirds of the total tilled acreage of the farms of the United States would be required for this purpose alone, and the remaining third would be insufficient to grow the corn needed for all other uses.

Fuel in Farm Values

If the average annual gasoline consumption per car is taken as 500 gallons, it may be figured, from the distillation yields given in the appendix, that to substitute alcohol as motor fuel would require for each automobile nearly 18 acres of wheat, or 9½ acres of corn, or 8¾ acres of potatoes. If by-product molasses were used, 46 acres of Louisiana sugar cane would be needed to furnish motive power for the average car, and even in the more highly productive sugar plantations of Hawaii 9 acres would be required. If sugar beets were used only for making alcohol, about 3 acres would be required to supply the equivalent of 500 gallons of gasoline, but although this source of alcohol is one of the most important in France, to replace gasoline consumption in 1926 in the United States (11,000,000,000 gallons) would require 66,000,000 acres of sugar beets, or nearly one hundred times the acreage now devoted to that crop in this country.

Not only does the large land area that would be involved in substituting alcohol for gasoline present difficulties, but to find the additional farm labor required to cultivate these raw materials might be an even more puzzling problem. Nor is much encouragement to be gained from a comparison of the cost of these substitutes from the farm with the price of gasoline. The estimate given in the appendix for the bare cost of manufacture of motor alcohol from molasses, not including the value of the molasses itself, is much higher than the present price of gasoline at the refinery. Or if corn is taken as the raw material, its present market price makes its alcohol content, even before extraction, much more expensive than the highest retail price of gasoline at the roadside filling station.

Possibilities of More Efficient Use

Inadequate design of carburetors and engines was mentioned in the board's earlier report as preventing the most economical use of gasoline, and it was pointed out that a tendency of gasoline prices to rise would stimulate efficiency in motor operation. It is a general rule that wasteful practices are checked only as price makes conservation worth while, but as yet the price of gasoline has had no appreciable effect on demand. Other factors bearing upon the consumption of motor fuel may be recognized, but it is difficult to weight their influence. Highway saturation on holidays and parking shortage on workdays tend to decrease the use of automobiles, but any lowered consumption from these causes is surely more than offset by the rapid growth of bus lines, with motors having a tenfold larger consumption than the average automobile, and by the increased use of closed cars.

With the larger recovery of gasoline from crude oil that is assured by the more general adoption of cracking and the increased economy and efficiency that can be expected from better motors, the number of miles in a barrel of petroleum should be greatly increased, and even some gain should be shown in the number of miles in a dollar's worth of gasoline. The best-informed specialists report to the board that the more efficient high-compression engine is coming—indeed, the compression ratio has already been increased in some models—and this improvement will make possible either better power or more mileage to the gallon. The present almost universal requirement by the American automobilist for power and "performance" will doubtless lead him to choose that at least some of the improvement shall be converted into greater flexibility and speed, but if the added efficiency is all utilized to give greater mileage, an increase of 25 to 40 per cent in miles per gallon is promised.

The motoring public now comprises considerably more than half of the population of our country, and if there is to be any saving of motor fuel, the automobilists must become effective conservationists. Without their co-operation, very little can be done; if they show a

OKLAHOMA GASOLINE CONSUMPTION CENTERS IN TWO LARGEST CITIES

The consumption of gasoline in Oklahoma centers in Tulsa and Oklahoma Counties, where the two largest cities, Tulsa and Oklahoma City, are located. These two counties consumed 4,372,365 gallons in November, or 20 per cent of the State's total. The Tulsa County total was 2,228,216 gallons, closely followed by Oklahoma County with a total of 2,144,149 gallons.

In Tulsa County, for November, 53 companies and individuals paid gasoline taxes. This large total is in part due to the fact that several oil companies and industrial organizations buy their gasoline in tank car lots and have their own distribution for employes and company use. However, there is an exceptionally large number of refiners and jobbing interests which have bulk and service stations in the county.

The accompanying table shows the first 15 companies in Tulsa County sold 1,627,793 gallons of gasoline in November. This was 73 per cent of the total for the county. The first five companies had 38 per cent of the total. The list of companies in the county includes several of the leading refinery organizations in the State. Most of these companies have several drive-in stations. The bulk of the gasoline is sold at drive-in stations, the bulk station business to garages, other curb pump operations being small.

Tulsa consumers have had exceptionally low prices for a period of several weeks, due to a price war which got under way last fall. This war was started by a jobbing concern, which in November sold 32,000 gallons of gasoline. Near this station a company known as the New Pirate Oil Co. took over a station and has consistently sold gasoline at the same price or under the price established by the first company. It will be noted that the New Pirate company sold 118,944 gallons in November from the one station, giving it sixth place in the county. This company at present is selling gasoline at 12 cents, including a 3-cent tax. This price is 2 cents under that of a majority of the companies.

The Southland Gasoline Co., which has several drive-in stations in the city with a large curb business, also sells 2 cents under the general market. This company in November was fifth in total sales.

Thirty-one companies and individuals paid taxes in Oklahoma County during November. The first 15 companies had 86 per cent of the total, and the first five companies 46 per cent. Several of the companies which have large gallonage in Tulsa County are also major distributors in Oklahoma County. Independent jobbing interests are stronger in the latter county.

LEADING DISTRIBUTORS IN TULSA AND OKLAHOMA COUNTIES

Tulsa County

Company—	November gallonage
The Texas Company	208,328
Barnsdall Refining Co.	207,460
Skelly Oil Co.	155,993
Continental Oil Co.	154,884
Southland Oil Co.	133,180
New Pirate Oil Co.	118,944
Harvey Young Oil Co.	110,912
Sun Co.	110,449
Cities Service Oil Co.	81,477
Gibson Oil Co.	66,575
Marland Refining Co.	66,322
Roxana Petroleum Corp.	60,387
Scotch Oil Co.	59,880
Transcontinental Oil Co.	48,545
Sinclair Refining Co.	44,457
Total (15 companies)	1,627,793
Total for county	2,228,216

Oklahoma County

Company—	November gallonage
Magnolia Petroleum Co.	232,138
Marland Refining Co.	191,568
The Texas Company	178,749
Transcontinental Oil Co.	178,100
High Test Oil Corp.	178,086
Yellow Cab Co.	148,239
Sloane Forsberg Co.	137,469
Barnsdall Refining Co.	120,480
Klein Oil Co.	119,751
Security Petroleum Co.	105,830
Cities Service Oil Co.	73,454
Eason Oil Co.	57,475
Champlin Refining Co.	56,653
A. W. Lee	40,788
Parkway Oil & Gasoline Co.	40,713
Total (15 counties)	1,859,472
Total for county	2,144,149

real desire to save fuel, appreciable results may be expected.

Newer Motors

The displacement of the present automobile motor by the Diesel type of heavy-oil engine or some modern type of steam engine or new electric motor might change the whole picture of automotive transportation, but even the Diesel motor and the steam engine would doubtless use petroleum products, though with more efficiency than the present gasoline motor.

Economy is claimed for the present type of storage-battery electric vehicle as compared with the gasoline car. The trend toward lower rates for electricity, as contrasted with an expected upward trend in gasoline prices, and the large saving in lubricants are cited as favoring lower operating costs for the electric vehicle. The lack of the lightweight storage battery, necessary to give the electric motor a wide touring radius, at present practically limits is use to the light truck for local delivery service. Its advantages over the gasoline car on frequent-stop city delivery routes are apparent and are recognized by such users as bakeries and express companies.

In its first report, this board, in referring to the possibilities of conservation of oil products through better use, recognized that co-operation between the refining branch of the oil industry and the automotive industry was an essential factor in developing the greater efficiency in use, and further study has made this even more evident.

Suggests Marketing Survey

Fortunately, several years ago farsighted leaders of the two industries realized this need for studies in the adaptation of motor and fuel to each other. Already much research has been done on this subject, both in company laboratories and in laboratories of the Government in co-operation with the two industries. The first studies resulted in substantial economies, and others now in progress promise equally gratifying results. However, an even larger and more comprehensive use of the principle of co-ordination is now urged. In Appendix 4, the Bureau of Standards reports in more detail on the co-operative research.

A more specific recommendation is offered on a matter that requires immediate consideration. The next step in motor improvement with the object of fuel economy is installation of the high-compression engine, but an essential preliminary to the general use of the improved motor is the wide distribution of special motor fuels adapted to high compression. It seems an opportune suggestion, therefore, that the American Petroleum Institute and the National Automobile Chamber of Commerce join in providing for a census by states of filling stations that supply the special funds essential to the adoption of high compression. Such a census would enable the automobile designer to decide whether the time had arrived when the more economical high-compression engine could find a country-wide market.

With this census of the stations supplying high-compression gasoline might be combined an enumeration of all filling stations. The figures thus obtained might be surprising to everyone and would furnish an obvious argument against the continuation of the unnecessarily expensive duplication of distributing facilities. The replies to the board's earlier questionnaire were almost unanimous in regarding this duplication as an economic waste, yet the country over the increase in both urban and rural stations continues at a rate far beyond the increase in gasoline consumption.

Progress in Oil Conservation

The co-operation asked of the oil industry by the Federal Oil Conservation Board has now become an active working force in the betterment of conditions. The oil programs at recent technical meetings have been marked by a wealth of scientific and engineering discussion, expressing the increased interest in every topic bearing on improvement of field and refinery practice. This interest in turn reflects the attitude and policy of the oil companies, many of which have made notable contributions to the common fund of knowledge of new devices and new methods through the presentation of papers by members of their engineering staffs. The stressing of the dissemination of knowledge that has been the guiding principle in governmental research must be adopted in co-operative industrial research if the Nation is to profit to the fu'l extent possible. "Scientific effort holds the promise of the future" only as the results of research are put to wise use.

The interest in oil conservation as a practical policy is now well exhibited in the increased attention given to the strengthening of the production departments of the large companies by the enlistment of engineers of highly specialized training. Many of the executives take a justifiable pride in the field experiments and laboratory research supported by large expenditure but looking toward larger recovery of the oil from the ground as well as to greater economy in operation; this is practical conservation applied to both the natural resource and the corporate capital.

A notable sign of the times is the indorsement given to oil conservation by the technical and trade press. The columns of these journals have been open for contributions from a wide circle of engineers and economists discussing every phase of the oil business. There has been no opportunity for interest to lag. Especially helpful has been the editorial attitude of most of the journals. Many of the more recent editorials show a full understanding of the true purpose of this Federal inquiry and give it a sympathetic support that will go far in justifying the faith "that Government and business can well join forces to work out this problem of practical conservation."

HUBERT WORK, Chairman.
DWIGHT F. DAVIS.
CURTIS D. WILBUR.
HERBERT HOOVER.

FRANK TALKS MARK TOM SLICK'S DINNER

(Continued from Page 36)

who was unable to be present, wired: "I am sincerely in sympathy with your reason for giving this dinner. An opportunity such as this for the men actively engaged in the operation of producing companies should help to a great extent in promoting better understanding among all of us."

Something that had not been announced beforehand was the fact that the meat served at the dinner was provided by game bagged by Mr. Slick and a party of friends on a hunting trip last week near Rockport, Tex., where they are members of a hunting club. Contributing to the menu were 230 wild ducks, 10 wild geese and 9 wild turkeys.

Nathan H. Gibson, Tulsa attorney, was toastmaster. The speakers, besides Mr. Slick, included Captain J. H. Grant, chief counsel for the Thomas B. Slick interests; James A. Veasey, vice president and chief counsel for the Carter Oil Co.; Mark McGee, Fort Worth, Tex., attorney, former adjutant general of Texas and former head of the American Legion in that state; Ray M. Collins, Tulsa, umpire in the Seminole Field since the institution of the curtailment plan in that area; Dana H. Kelsey, Independence, Kans., vice president and general manager of the Prairie Oil & Gas Co.; and E. B. Reeser, Tulsa, president of the Barnsdall Oil Co. Henry McGraw, vice president, Gypsy Oil Co., who had been scheduled to speak, was prevented by slight illness.

Captain Grant outlined the purpose of the meeting, enlarging upon the sentiment expressed in Mr. Slick's letters of invitation.

Telling of the considerations that had led him to plan the dinner, Mr. Slick said:

"I have had a feeling for years that oil men were losing a world of money and sacrificing what should be legitimate profits because they were drilling too many wells to the 160 acres and drilling too fast. In thinking the thing over it occurred to me that a dinner like this would afford a good opportunity for the boys to get acquainted, and with this acquaintanceship as a background it would be possible to get closer together in the adoption of some co-operative program. It is not to be expected that specific plans should be arrived at here, but some suggestions can be made and we can understand each other better.

"My own feeling is that at the very start, in order to accomplish anything definite and permanent in the Mid-Continent Field each company operating in it should appoint a man authorized to say yes or no to any conservation plan offered. It would be absolutely essential in the operation of a co-operative agreement to have the companies represented by men fully empowered to speak bindingly for the company, without the delays and confusion involved in correspondence between a representative in the field and the headquarters of the company in some distant city.

"In picking an executive commitee such as this would be I would suggest that each of the major companies be represented by two delegates; each company producing 1,000 to 10,000 bbls. a day, one delegate, and that all the operators producing less than 1,000 bbls. a day be represented by one delegate for each 1,000 bbls. of production. Thus everybody would have a voice in the plan.

"It seems to me, too, that a committee should be appointed to work out a standard scale of overhead charges in all pooled or partnership areas, and that this scale should favor the small producer so that he would not hestitate to join with the others in any pooling agreement. And I want to say that I beieve the pooing of acreage is the greatest agent of stabilization yet devised.

One Well to 40 Acres

"Personally, I believe that we are losing $1,000,000 in every quarter section as a result of the practice of drilling 16 wells to a quarter section. Wells cost more, too, when they are drilled with a rush, and I would like to see one of the major Seminole pools under an operating plan by which not more than one string of tools would be running at one time on any 40 acres.

"Every major pool in Oklahoma has brought the price of oil down to a point where there was no profit in it. This was true in the Glenn Pool, Cushing, Tonkawa, Burbank—all of them. This is wholly unnecessary. Drilling in all such pools should be carried on under some conservative and common-sense agreement that would not require sacrifice of profits and needless production of oil.

"There is one experiment I would like to see tried. I'd like to see a Wilcox Pool developed with a well in the center of each 40 acres, the experiment to last through a period of two years, in order to ascertain what the drainage results would be. At the end of that time a majority of the operators could decide to drill additional wells to thoroughly drain the sands. It would be only an experiment, it is true, but it seems to me the operators could afford to make one experiment of that kind.

"I have called the men together at this dinner because I seemed to be the logical one to do it, for I don't believe I have an enemy among either the big producers or the little ones, and I have the kindliest feeling toward them all."

Mr. Slick added that in the mass of hurried work entailed in preparation for the dinner he feared that some operators, even old friends of his perhaps might have been missed in sending out invitations.

Mr. McGee convulsed the crowd by "ragging" some of his intimate friends. He revealed what he declared was the reason E. E. Kirkpatrick, associate of Mr. Slick in oil operations, had to leave Texas, and why Tom Bryant of Fort Worth, Tex., president of the Canyon Oil & Gas Co., couldn't come to Oklahoma to live. T. B. Yarbrough, active vice president of the Firt National Bank of Fort Worth, stayed in the banking business, Mr. McGee said, to pay for the dry holes he drilled as oil operator. "You can always tell when he's struck another dry hole," said the speaker. "He raises the interest rates on loans."

Public Should Be Educated

Speaking in more serious vein, Mr. McGee declared that the oil industry should educate the public to a realization of the part the oil industry actually is playing and should be helped to see the fact that its interests and the industry's interest are parallel. Then, said Mr. McGee, the people will not try to tax the industry to death and will send to the Legislature men who will quit hampering the industry at every turn. The people should be taught to know that the petroleum industry, through lease money and bonus money, has paid off more farm mortgages than any other thing and that it has built schools, constructed roads and established various institutions through the money obtained through taxation.

Mr. Collins told briefly the history of the Seminole experiment in co-operation. At first, Mr. Collins said, the operators, who in great measure knew each other as business rivals only, manifested doubt and suspicion. This was especially observable in the earlier conferences held to adjust divergent interests and reconcile differences of viewpoint. After a few meetings, Mr. Collins said, the indications of distrust began to wear off and eventually the operators came to see in each other just fellow men worried by common perplexities and often willing to make personal sacrifices if that would contribute to the general good.

Mr. Collins unreservedly declared that the Seminole adventure was a success and that it pointed the way to further efforts along the same line. Thousands of dollars, he said, would have been saved by the operators if they had entered into a curtailment agreement long before they did. He advocated adoption by leaseholders of a uniform system of spacing wells which he said would result in great economies in drilling operations and would spread the period of high production over a much longer period, with attendant benefits.

Regardless of clashing interests, the word of the Seminole operators once given was kept inviolate, Mr. Collins said. He emphasized the sportsmanlike conduct of the operators, mentioning specifically the agreement entered into last week by the Gypsy Oil Co., Carter Oil Co., Magnolia Petroleum Co., Independent Oil & Gas Co. and Sinclair Oil Co. to curtail production and stop the drilling of certain wells, knowing in advance that though they eventually would recover the oil it would be at greater cost.

Approval of the co-operative movement was expressed by Mr Reeser, Mr. Kelsey and Mr. Veasey in their addresses. They cited Seminole as an example of what can be done by operators in solving their own problems.

AMERICAN CHEMICAL SOCIETY ESSAY CONTEST

The prize essay contest held under the auspices of the American Chemical Society, and open to high and secondary school students, has had funds provided for the fifth consecutive year by Mr. and Mrs. Francis P. Garvin, of New York, according to the announcement of the state chairman for Oklahoma, Dr. C. K. Francis, technical editor of The Oil and Gas Journal.

Contestants must write under one of the following six topics; (1) The relation of chemistry to health and disease; (2) the relation of chemistry to the enrichment of life; (3) the relation of chemistry to agriculture or forestry; (4) the relation of chemistry to national defense; (5) the relation of chemistry to the home; (6) the relation of chemistry to the development of an industry or a resource of the United States. A separate contest will be conducted in each state, with six prizes of $20 each, one for each topic. The six best papers from the whole country are awarded a 4-year scholarship in any educational institution in the United States and $500 annually for expenses.

CALIFORNIA MARKET GASOLINE WEAKENING

LOS ANGELES, Calif., Jan. 14.—During the past two weeks considerable quantities of high gravity refining crude from the new deep sand at Signal Hill has been run through several of the smaller refineries. Most of this oil represents flush production with the result that these plants have a very suddenly and substantially increased production of gasoline. Only a small portion can be stored and the rest is being offered in tank car lots at prices considerably below those obtaining heretofore. The result has been a weakening of one-half to 1 cent in the average open market price of tank car gasoline in and around Los Angeles. A very excellent grade of U. S. Motor gasoline can now be freely bought at prices ranging from 8 to 8½ cents f.o.b. refinery, Los Angeles County.

Export prices are holding firm at 6 to 6⅛ cents, at tidewater for bulk gasoline. U. S. Motor grade in cased cans will net from 7¼ to 7½ cents. After a spell of weakness for several months last summer, the market for natural gasoline strengthened considerably. This was due entirely to the fact that the spot natural available at that time was contracted to the Union Oil Co. of California presumably for use in connection with the high grade export gasoline being manufactured for the Atlantic Union Oil Co. of Australia, Ltd. This is the joint venture of the Union Oil Co. of California and Atlantic Refining. Very large quantities of natural gasoline have been purchased by the Union Oil Co. and by the local agent for the Atlantic Refining Co. in recent months, and the market for the past three months has been stripped bare of spot natural. During the past week two long-term contracts between natural gasoline manufacturers and large refining companies expired with the result that the price of spot natural has dropped from a range of 8½ to 9 cents to from 7½ to 8 cents.

The weakness indicated in connection with U. S. Motor and natural gasolines has communicated itself to engine distillate which is also off fractionally.

Kerosene Stronger

The kerosene market is relatively good. Kerosene in the domestic market is bringing from 5½ to 6 cents. Occasional offerings at 5 cents do not seem to disturb the situation. Kerosene for the export trade is being readily bought at 4½ to 5½ cents, depending on gravity, the lower gravity product going largely into the oriental market whereas the higher gravity is more in demand in Australia.

Fuel distillate and smudge oil for use in the citrus groves have both been strong for several weeks, prices being firm from 2½ to 3 cents, depending on quality.

Fuel oil and lubricating oils remain quiet with prices unchanged. The Southern California tank car price of fuel oil quoted by the smaller refiners is very soft, sales being made from 64 cents up to 80 cents. The major companies are maintaining a price ranging from 80 cents to the nominal posted price of $1 per barrel.

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 42)

Gulf Prod. Co.'s No. 3 W. N. Waddell, SE cor. NE Sec. 3, Blk. B-25, Public School Land ..... Top salt 1,165 ft.; drlg. 2,850 ft., anhydrite.

J. K. Hughes Dev. Co.'s No. 1 State Bank Commission, CSL Sec. 18, Blk. 4, H. & T. C. Sur. ..... Location.

Humble O. & R. Co.'s No. 1 University-B ..... Top salt 1,220 ft.; drlg. 1,430 ft.

Independent O. & G. Co.'s No. 2 University-B ..... Top salt 1,270 ft.; drlg. 2,840 ft.

CROCKETT COUNTY

George Anderson and Marland Oil Co.'s No. 1 University.. Hole full sulphur water 1,800 ft.; ½ bailer oil 2,240 ft.; ½ bailer sulphur water per hour 2,475 ft.; shut down 2,631 ft.

V. T. Bolin & Co.'s No. 1 P. C. Coates, NW cor. SW Sec. 4, Blk. 2, I. & G. N. Sur. ..... Shut down 2,110 ft.

Dixie Oil Co.'s No. 1 George Thompson ..... Location.

J. S. Cosden, Inc., No. 1 Paul Perner, SW cor. Sec. 36, Blk. 2, I. & G. N. Sur. ..... Shut down 595 ft. for 15-in. pipe.

Humble O. & R. Co.'s No. 2 P. J. Sorg Est. ..... Rig.

James Kelly et al's (was Corbett & Gill's) No. 1 Todd, C NE Sec. 43, Blk. WX, G. C. & S. F. Sur. ..... Top salt 993 ft.; show oil 1,948 ft.; 700 ft. sulphur water in hole 2,450 ft.; total depth 2,605 ft.; plugged back to 1,948 ft. and shot 120 qts. 1,909-45 ft.; hole filled 250 ft. with water with slight scum of oil.

Van McPhail's No. 1 George Thompson ..... Location.

Van McPhail et al's No. 1 George Thompson ..... Location.

Osage Oil Corp.'s No. 2 Haiff, 1,200 ft. down river from No. 1 in Sec. 70, Blk. 1, I. & G. N. Sur. ..... Spudding.

William Schaffer et al's No. 2 University, 1,350 ft. N and 2,610 ft. E of SW cor. Sec. 9, Blk. 47, University Land ..... Top salt 1,060 ft.; first oil show 2,190-96 ft.; second 2,225-29 ft.; 1 bailer oil in 10 hrs. at 2,590 ft.; shut down 2,635 ft., brown lime.

Simmons Oil Co. et al's No. 1 H. M. Halff, NW cor. Sec. 69, Blk. 1, I. & G. N., elev. 2,157 ft. ..... Top salt 445 ft.; show oil 610 ft.; 1,000,000 ft. sweet gas 865-71 ft.; little increase 930-40 ft.; little sulphur gas 1,132 ft.; hole full sulphur water 1,285-90 ft.; will plug back and test gas.

W. W. Donnelly & Young's No. 1 Massey, Sec. 29, Blk. U-V ..... Shut down 520 ft.

World Oil Co.'s No. 1 Schneeman-B, Sec. 50, Blk. BB, G. C. & S. F. Sur. ..... Top salt 1,070 ft.; hole full salt water 2,210-15 ft.; drlg. by tools 2,310 ft.

Young & Donnelly's No. 1 J. M. Shannon, C Sec. 11, Blk. 9, D. & S. E. Sur. ..... 7,000,000 ft. gas at 1,662 ft.; shut down 1,676 ft.

CULBERSON COUNTY

Deep Rock Oil Co.'s No. 2 Kloh-Rumsey, Sec. 21, Blk. 29, T. & P. Sur., T-1 (NE of No. 1) ..... Shut down 1,165 ft.

Deep Rock Oil Co.'s No. 1 J. P. Seay ..... Drlg. 840 ft., hard lime.

Hickey & Stivers' No. 1 C. O. Finley ..... Spudding 40 ft.

James H. Gardner et al's No. 1 Radford, C SE Sec. 29, Blk. 62, Public School Land Sur. ..... Fish. 750 ft.

Scott & Dittman's No. 1 Miller, SW cor. NW NE Sec. 1, School Blk. 97 ..... Drlg. 675 ft.

EL PASO COUNTY

Ellsworth & Haunt's No. 1 McKinney & Jones ..... Rig.

FISHER COUNTY

Cranfill & Reynold's No. 1 J. A. Young, Sec. 208, B. B. B. & C. Sur. ..... Hole full salt water 2,400-35 ft.; swedging 8-in. 2,870 ft.

Ideal Oil Co.'s No. 1 Jameson, C SE Sec. 111, Blk. 1, H. & T. C. Sur. ..... Hole full salt water 2,345-2,520 ft.; shut down 3,431 ft.

Marland Oil Co. and Vacuum Oil Co.'s No. 1 J. H. R. Lagow ..... Hole full salt water 3,530 ft.; set 6-in. 3,670 ft.; hole caving 3,792 ft.

R. W. Raney's No. 2 Maberry, Sec. 56, Blk. 1, T. & P. Sur. ..... Shut down for orders 2,743 ft.; moving in casing.

The Texas Company's No. 1 D. S. Stevens, C SW SE SE Sec. 79, Blk. 1, H. & T. C. Sur. ..... Hole full water 2,570-2,615 ft.; top pay 3,239 ft.; drlg. 3,259 ft.; swabbed 165 bbls. Saturday.

FOARD COUNTY

Clark et al's No. 1 Atkins ..... Lime 1,580-1,930 ft.; show gas 1,885 ft.; shut down for casing 2,510 ft.

The Texas Company's No. 1 Watkins ..... Total depth 3,720 ft.; pulling pipe to abandon.

GARZA COUNTY

Emerald Oil Co.'s No. 1 D. Boren, NW cor. NE Sec. 137, Blk. 5, H. & G. N. Sur. ..... Small show oil in gray lime 1,884-1,902 ft.; shut down 2,600 ft.; show oil and hole full water 2,420-60 ft.

Emerald Oil Co.'s No. 2 D. Boren ..... Building rig.

Gulf Prod. Co.'s No. 1 E. P. Swenson-A, Sec. 67, Blk. 2, H. & G. N. Sur. ..... Top salt 495 ft.; top lime 2,075 ft.; drlg. 3,300 ft.

GLASSCOCK COUNTY

Texon & Marland's No. 1 Settles ..... Set 10-in. 1,420 ft.; top lime 2,015 ft.; hole full sulphur water 2,710-50 ft.; drlg. 2,770 ft.

R. R. Penn's No. 1 Hughes & Johnson ..... New location.

HOWARD COUNTY

Bristow & Merrick's No. 1 Dora Roberts ..... Rotary rig.

Coyle-Concord Oil Co.'s No. 3 Dora Roberts, Sec. 156, Blk. 29 ..... Drlg. 1,460 ft.

Dixie Oil Co.'s No. 1 H. R. Clay ..... Shut down 3,347 ft.

Henshaw et al's No. 1 W. R. Settles, SW SE SW Sec. 135, Blk. 29 ..... Hole full sulphur water 1,325-30 ft.; shut down 1,900 ft.

Lockhart & Co.'s No. 1 Dora Roberts, Sec. 157, Blk. 29 .. Shut down for water 1,707 ft.

Marland Oil Co.'s No. 1 Clay-E, NW NE SE Sec. 138, Blk. 29 ..... Pay 2,480-2,500 ft.; swabbed approx. 160 bbls.; hole full salt water 3,360-70 ft.; total depth 3,656 ft.; plugged back to 3,210 ft.; cem .and set lead plug.

Marland Oil Co.'s No. 1 Richardson, C NW Sec. 12, Blk. 32, T. & P. Sur., T-1-S ..... Top salt 870 ft.; hole full salt water 2,235-2,300 ft.; hole full sulphur water 2,790-2,800 ft.; fishing 2,845 ft.

Marland Oil Co. and Zoch's No. 1 Jones, Sec. 32, Blk. 27, T. & P. Sur., elev. 2,218 ft. ..... Top lime 2,250 ft.; drlg. 2,860 ft.

Maya, Nixon & Flowers' No. 1 W. J. Flowers ..... Little salt at 976-97 ft.; top salt 1,114 ft.; shut down 1,390 ft.

Miley and Marland Oil Co.'s No. 1 C. D. Read, C NW Sec. 12, Blk. 31, T. & P. Sur., T-1-N ..... Spudded and shut down 5 ft.

Owens & Sloan's No. 3 Dora Roberts, SW cor. SE Sec. 136, Blk. 29 ..... Swabbed 200 bbls. in 3 hrs. at 2,560-92 ft.; drlg. 2,725 ft.; hole full oil.

Peer Oil Corp.'s No. 1 Read, C NW Sec. 39, Blk. 30, T. & P. Sur., T-1-N ..... Hole full salt water 2,790-2,820 ft.; drlg. 3,255 ft.; ¾ bailer sulphur water per hr. 3,195 ft.

Schermerhorn Oil Co.'s No. 1 Dora Roberts ..... Swedging casing 2,320 ft.

Schermerhorn Oil Co.'s No. 1-A Dora Roberts, SW cor. NE ..... Drlg. 1,470 ft.

Sun Oil Co.'s No. 1 W. R. Settles, Sec. 135, Blk. 29 ..... Drlg. 735 ft.

Sprague Oil Co.'s No. 1 Dora Roberts ..... Location.

Texon O. & L. Co. and Marland Oil Co.'s No. 1 Mrs. Connaly, NE cor. Sec. 15, Blk. 33, T. & P. Sur., T-1-N ..... Top salt 1,425 ft.; hole full salt water 1,760-1,800 ft.; show oil 3,065 ft.; hole full sulphur water 3,500-55 ft.; hole full water 3,925-50 ft.; show oil 4,125-36 ft.; total depth 4,146 ft.; drilled out plug; filled 300 ft. sulphur water in 12 hrs.

Texon O. & L. Co. and Marland Oil Co.'s No. 2 W. R. Settles ..... Shut down for storage; sand at 1,280-84 ft.; total depth 1,298 ft.

Texon & Marland's No. 2 W. R. Settles-A ..... Rig; drlg. water well.

Weekly Oil Corp. et al's No. 1 Dora Roberts, Sec. 156, Blk. 29 ..... Underreaming 12-in. 825 ft.

HUDSPETH COUNTY

American Land Co.'s (was Lockhart Bros.') No. 1 Gardner & Moseley, C SE Sec. 5, School Blk. 21 ..... Shut down 1,000 ft.

Western States Oil Co.'s (was Lockhart & Co.'s) No. 1 Moore, C SE Sec. 16, Blk. 71, T. & P. Sur., T-6 ..... Ran 12-in. 905 ft. and shut down.

Western States Oil Co.'s No. 1 Gardner & Moseley, Sec. 12, Blk. 18 ..... Drlg. 750 ft.

IRION COUNTY

F. E. Webb et al's No. 1 J. M. Nutt ..... Spudded and shut down 125 ft.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means ..... Straightening hole 2,600 ft.

Humble O. & R. Co.'s No. 2 Crecencio Flores, 1,130 ft. N and 850 ft. E of SW cor. Sec. 34, Blk. 58, T. & P. Sur., Twp. 8 ..... Drlg. 3,505 ft. with hole full water.

JONES COUNTY

Midwest Expl. Co.'s (was Campbell et al's) No. 1 L. H. Herndon, Sec. 6, M. E. P. & P. Sur., elev. 1,832 ft. .. Total depth 3,009 ft.; plugged back to 2,580 ft.; shot 40 qts. 2,558-61 ft.; 250 ft. fluid in hole.

Garland & Diamond's No. 1 E. D. Glynn, SE cor. Sec. 18, Deaf & Dumb Asylum Lands ..... Shut down 2,430 ft.

Hutson & Weaver's No. 1-A Smith ..... Hole full water 2,240-50 ft.; fish. 2,300 ft.

Phillips Pet. Co.'s No. 1 O. H. Pomroy, SE cor. SW Sec. 16, Blk. 18 ..... Drlg. 1,000 ft.

W. G. Stough et al's No. 1 W. C. Bennett, Sec. 42, Orphan Asylum Sur. ..... Shut down 800 ft.

W. G. Stough and others' No. 1 J. P. Willis, J. C. Patterson Sur. No. 2 ..... Shut down 1,740 ft.

Swensondale Oil Co.'s No. 1 Caton, SW NW Sec. 9, Deaf & Dumb Asylum Lands ..... Show oil 3,008-20 ft.; shot 30 qts., no results; total depth 3,398 ft.; plugged back to 3,060 ft.; shot 130 qts. 3,008-25 ft.; cleaning out.

KNOX COUNTY

Deep Rock Oil Co.'s No. 1 Moore ..... Drlg. 850 ft.

Deep Rock Oil Co.'s No. 1 Big Four, 1,270 ft. S and 2,590 ft. W of NE cor. Sec. 31, Blk. 4 ..... Shut down 3,513 ft.; may deepen to 4,000 ft.

LOVING COUNTY

Delaware Oil Co.'s No. 1 Lockhart & Ramsey ..... Rigging up cable tools.

Lockhart Bros.' No. 1 fee, Sec. 85, Blk. 33, H. & T. C. Sur. ..... Set 12-in. 570 ft.

Owens & Sloan's No. 1 W. D. Johnson, C SE Sec. 20, Blk. 53, T-2, T. & P. Sur., elev. 2,934 ft. ..... Top salt 955 ft.; drlg. 1,750 ft.

LYNN COUNTY

Elpo Oil Co.'s No. 1 Nevols, NW cor. Sec. 6, Blk. C-43, School Lands ..... Shut down 630 ft.

Hart Oil Corp.'s No. 1 C. O. Edwards A-1 ..... Rigged up and shut down.

MENARD COUNTY

Carpenter & Robbins' No. 1 Kothman ..... 165 ft. 34.6 grav. oil at 414-15 ft.; shut in.

May & Clark's No. 1 Callan Ranch ..... Drlg. 350 ft.

Renfro et al's No. 1 J. Davis ..... Drlg. 185 ft.

MIDLAND COUNTY

Gholson et al's (was Orbit Oil Co.'s) No. 1 Moreland, C SE Sec. 17, Blk. 39, T. & P. Sur., T-1-S ..... Total depth 185 ft.; to resume drlg.

Shoup et al's No. 1 Roy Parks ..... Location.

MITCHELL COUNTY

Boehn Drilling Co.'s No. 1 Harry Hyman ..... New location.

Paul Teas et al's No. 1 A. C. Mills, NW cor. C. A. O'Keefe Sub. 11, J. P. Smith Sur. ..... Drlg. 1,040 ft.

Robert Thraves' No. 1 C. Way, Sec. 91, Blk. 27, T. & P. Sur., T-1-N ..... Total depth 2,508 ft.; shut down.

NOLAN COUNTY

Herbert Oil Co.'s (was McClesky and others') No. 1 Pepper, SE cor. SW Sec. 29, Blk. 22, T. & P. Sur.... Rigged up and shut down.

Winemiller Corp.'s (was Reiter-Foster Oil Co.'s) No. 1 T. E. Arledge, Sec. 217, Blk. 1, H. & T. C. Sur. ..... Shut down 3,000 ft., contract depth.

Zweifel et al's No. 1 Longbotham, C SE Sec. 130, Blk. 1, H. & G. N. Sur. ..... Shut down 3,645 ft.

PECOS COUNTY

George Anderson's No. 1 Sherbine Bros. — Top salt 928 ft.; drlg. 1,120 ft.
Bob Elmore's No. 2 Holmes — Drlg. 150 ft.
Buell & Hagan's No. 1 Pryor & Wilson — Location.
Diamond Pet. Co.'s No. 1 Blackstone & Slaughter — Location.
M. C. Dibble & Hale's No. 1 Bonebrake, Sec. 115, Blk. 8, H. & G. W. Sur., elev. 2,555 ft. — Shut down 640 ft.
Everett et al's No. 1 J. Fields — Spudded and shut down.
Gibson Oil Corp.'s No. 1 R. R. Russell — Straightening hole 670 ft.
George A. Henshaw et al's No. 1 B. T. Corder, C SW Sec. 74, Blk. 2, C. C. S. D. Sur. — Top salt 1,130 ft.; drlg. 1,400 ft.
George A. Henshaw, Jr., No. 1 Sweatt & Hinyard, Sec. 29, Blk. 144, T. & St. L. Sur., elev. 2,780 ft. — Hole full sulphur water 1,275-80 ft.; shut down 2,535 ft.
Kershaw & Livingston's No. 1 Cannon — Rigging up.
Kirby Pet. Co. and Roxana's No. 1 W. W. Turney, NW cor. SW Sec. 11, Blk. 140, T. & St. L. Sur. — Hole full sulphur water 975-83 ft.; shut down 1,189 ft.
Mid-Kansas O. & G. Co.'s No. 1 Pryor & Wilson, NW cor. Sec. 3, Blk. 5, T. C. R. R. Sur. — Rigged up and shut down.
Miller & McNees' No. 1 W. C. Tyrrell — Location.
Moody Oil Corp.'s No. 1 B. T. Corder, C SW Sec. 77, Blk. 2, C. C. S. D. Sur. — Drlg. 2,210 ft.
Olean Pet. Co.'s No. 1 G. N. Harral, C SW Sec. 82, Blk. R-3, G. C. & S. F. Sur., elev. 3,005 ft. — 1,200 ft.; salt water 2,965-78 ft.; set 8-in. 2,977 ft.; drlg. 3,830 ft.
Quinby Oil Co.'s No. 2 Bennett, C NW 592, Blk. 105, G. C. & S. F. Sur., elev. 2,560 ft. — Cleaning out 1,465 ft.
Quinby Oil Co.'s No. 1 A. A. Gray, 660 ft. N and 1,320 ft. E SW cor. Sec. 593, Abst. 3,009, elev. 2,551 ft. — Shut down 700 ft. to deepen.
Robert Lee's No. 1 Joe Parker — Rigging up.
B. J. Spikes' No. 1 George Brown — Shut down 250 ft.
Transcontinental Oil Co.'s No. 1 Blackstone & Slaughter, Sec. 29, Blk. 129, St. L. Sur., elev. 3,539 ft. — 250 ft. sulphur water in black sand 1,150-80 ft.; small show oil 1,510 ft.; show gas 1,540 ft.; show oil 2,080 ft.; brown sand 3,560-70 ft.; 250,000 ft. gas at 3,565 ft.; drlg. 4,230 ft., black shale.
Vacuum Oil Co.'s No. 1 Elsinore Cattle Co. — Building rig.
World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 8, T. P. R. R. Sur., elev. 2,810 ft. — Rigged up and shut down.
World Oil Co.'s No. 1 Serf, C NE Sec. 10, Blk. 130, T. & St. L. Sur., elev. 3,435 ft. — Drlg. 500 ft.

Yates Pool, Pecos County

Allsman & Bell's No. 6 River Bed — Waiting on machine.
Allsman & Bell's No. 8 River Bed — Drlg. 833 ft.
Allsman & Bell's No. 9 River Bed — Driving piling.
Allsman & Bell's No. 10 River Bed — Machine.
Allsman & Bell's No. 11 River Bed — Drlg. 1,750 ft.
Allsman & Bell's No. 12 River Bed — New location.
Allsman & Bell's No. 13 River Bed — New location.
California Co.'s No. 2 Yates, Sec. 34, Blk. 194 — Rig.
California Co.'s No. 9 Yates, Sec. 34, Blk. 194 — Drlg. 560 ft.
California Co.'s No. 10 Yates, Sec. 34 — Drlg. 400 ft.
California Co.'s No. 11 Yates, Lease 1 — Drlg. 520 ft.
California Co.'s No. 12 Yates, Lease 1 — Rigging up.
California Co.'s No. 13 Yates, Lease 1 — New location.
California Co.'s No. 1 Smith, Lease 1 — Drlg. 755 ft.
California Co.'s No. 6 Smith, Lease 3, Sec. 35 — Straightening hole 1,466 ft.
California Co.'s No. 8 Smith, Lease 3 — Top pay 1,256 ft.; drlg. with 200 ft. oil.
California Co.'s No. 9 Smith, Lease 3 — Drlg. 551 ft.
California Co.'s No. 10 Smith, Lease 3 — Rigging up.
California Co.'s No. 11 Smith, Lease 3 — Building rig.
California Co.'s No. 12 Smith, Lease 3 — New location.
*Day Bros. & McKnight's No. 1 Yates, NW cor. Sec. 58, Blk. 1 — Top salt 440 ft.; shut down 935 ft.
Douglas Oil Co.'s No. 2 J. T. Sellman — Hole full salt water 795-860 ft.
Gulf Prod. Co.'s No. 5 Smith-A — Drlg. 1,570 ft.; hole full oil.
Gulf Prod. Co.'s No. 6 Smith-A — Drlg. 1,042 ft.
Gulf Prod. Co.'s No. 7 Smith-A — Drlg. 1,055 ft.
Gulf Prod. Co.'s No. 8 Smith-A — Rigging up.
Gulf Prod. Co.'s No. 9 Smith-A — Moving in material.
Gulf Prod. Co.'s No. 6 Yates — Drlg. 1,215 ft.
Humble O. & R. Co.'s No. 6 Smith-A — Drlg. 1,080 ft.
Humble Oil Co.'s No. 4 M. A. Smith-B — Tools stuck 290 ft.
McMan O. & G. Co.'s No. 2 J. H. Tippett — Rigging up.
*Madra and Savoy's No. 2 Smith, Sec. 24, Blk. 194 — Location.
McMan and Marland's No. 15 Yates — 200 ft. oil 1,105 ft.; top pay 1,210 ft.; drlg. 1,275 ft.; flowing 250 bbls. hr.
McMan and Marland's No. 16 Yates — Rig.
Mid-Kansas and Transcontinental's No. 10 Yates-A, Sec. 33½, Blk. 194 (N of No. 1) — Top pay 1,026 ft.; drlg. 1,050 ft.; flowing by heads.
*Mid-Kansas and Transcontinental's No. 11 Yates-A, Sec. 33½, Blk 194 (S of No. 1) — Top pay 1,025 ft.; shut down 1,040 ft.; flowing 497 bbls. hr.
Mid-Kansas and Transcontinental's No. 12 Yates-A — Drlg. 530 ft.
Mid-Kansas and Transcontinental's No. 13 Yates-A — Shut down 310 ft.
Mid-Kansas and Transcontinental's No. 14 Yates-A — Waiting on machine.
Mid-Kansas and Transcontinental's No. 15 Yates-A — Waiting on machine.
Mid-Kansas and Transcontinental's No. 10 Yates-B, Sec. 61, Blk. 1 — Rigging up.
Mid-Kansas and Transcontinental's No. 11 Yates-B — Spudding.
*Mid-Kansas and Transcontinental's No. 12 Yates-B — Waiting on machine.
Mid-Kansas and Transcontinental's No. 18 Yates-B — Show oil 1,095 ft.; flowed sulphur water 1,108 ft.; cem.; shut down.
Mid-Kansas and Transcontinental's No. 19 Yates-B — Cleaning out 735 ft.
Mid-Kansas and Transcontinental's No. 20 Yates-B — Shut down 1,025 ft.; moving boiler back.
Mid-Kansas and Transcontinental's No. 21 Yates-B — Drlg. 400 ft.
Mid-Kansas and Transcontinental's No. 22 Yates-B — Cellar.
Mid-Kansas and Transcontinental's No. 23 Yates-B — Drlg. 700 ft.
Mid-Kansas and Transcontinental's No. 24 Yates-B — Drlg. 300 ft.
Mid-Kansas and Transcontinental's No. 25 Yates-B — Drlg. 300 ft.
Mid-Kansas and Transcontinental's No. 6 Yates-C — Rigging up.
Mid-Kansas and Transcontinental's No. 10 Yates-C — Location.
Mid-Kansas and Transcontinental's No. 2 M. A. Smith — First oil and gas show 1,095 ft.; top pay 1,110 ft.; shut down 1,126 ft.; hole filled 900 ft. oil.
Mid-Kansas and Transcontinental's No. 2 Yates-D, SW part Sec. 62, Blk. 1 — Top pay 1,127 ft.; drlg. 1,215 ft
Mid-Kansas and Transcontinental's No. 1 Yates-F — Rigging up.
Mid-Kansas and Transcontinental's No. 7 Smith-Taylor — Spudding.
Mid-Kansas and Transcontinental's No. 8 Smith-Taylor — Drlg. 450 ft.
Mid-Kansas and Transcontinental's No. 9 Smith-Taylor — Waiting on machine.
Mid-Kansas and Transcontinental's No. 10 Smith-Taylor — Rigging up.
Mid-Kansas and Transcontinental's No. 11 Smith-Taylor — New location; cellar.
Mid-Kansas and Transcontinental's No. 12 Smith-Taylor — New location; cellar.
Oregon Oil Corp.'s No. 1 Yates — Drlg. 325 ft.
Phillips Pet. Co.'s No. 1 Mrs. M. A. Smith — Rigging up.
Sun Oil Co.'s No. 1 Yates — New location; drlg. 50 ft.
Roxana Pet. Corp.'s No. 6 J. H. Tippett, Sec. 102, Blk. 194 — Drlg. 1,176 ft.
Roxana Pet. Corp.'s No. 3 Smith, SE cor. SW Sec. 27, Blk. 194 — Top pay 1,560 ft.; shut down 1,723 ft.; flowing 179 bbls.
Roxana Pet. Corp.'s No. 4 Smith — Top pay 1,647 ft.; shut down 1,704 ft.; flowing and swabbing 245 bbls.
Roxana Pet. Corp.'s No. 5 M. A. Smith, Sec. 27, Blk. 194 — Drlg. 1,400 ft.
Simms Oil Co.'s No. 4 Smith, Sec. 103, Blk. 194 — Drlg. 1,130 ft.
Simms Oil Co.'s No. 5 Smith — Drlg. 1,192 ft.
Simms Oil Co.'s No. 6 Smith — Shut down 1,074 ft.; 32,000,000 ft. gas 1,045-72 ft.
Sun Oil Co.'s No. 1 Yates — Drlg. 400 ft.

PRESIDIO COUNTY

Headlock & Miller's No. 1 Tootle Est., Sec. 123, Blk. 3, D. & P. Sur., elev. 2,912 ft. — Salt water 2,610 ft.; total depth 3,003 ft.; shut down for orders.
Pinto Canyon Oil Co.'s No. 1 Fields, 1,760 ft. S and E NW cor. Sec. 74, Blk. 2, D. & P. Sur. — Location.
Moody Oil Corp.'s No. 1 R. A. Walters et al — New location; moving in material.

REAGAN COUNTY

Hagan & Emch's No. 1 E. W. Loftin — New location.
Henshaw & Camp's No. 1 University, Sec. 14, Blk. 49, University Land, elev. 2,772 ft. — 250 ft. sulphur water at 800 ft.; cem. 8-in. 2,205 ft.
Moody Oil Co.'s No. 1 R. A. Walters — Rigging up.
Skelly Oil Co.'s No. 1 University, SW cor. Sec. 33, Blk. 5, University Land — Top salt 1,340 ft.; run. 8-in. 2,795 ft.
Texon O. & L. Co.'s No. 1-B University, Group 1 — Top pay 6,284 ft.; drlg. 7,140 ft. 1,500 ft. oil in hole.
White et al's No. 1 Shofner & Sterling, NE cor. NW, Sec. 10, 2 m. N of Big Lake — Top salt 1,275 ft.; hole full fresh water 2,155 ft.; drlg. 2,175 ft.

REEVES COUNTY

Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft. — Show oil 1,105-10 ft.; drlg. 1,424 ft.
Grisham-Hunter Corp.'s No. 1 Rathge & Connor, 600 ft. from N line and 5,760 ft. from W line of Sec. 26, Blk. 2, H. & G. N. — Spudding 165 ft.; hole full fresh water.
David R. Thompson's No. 1 A. A. Eddins — Drlg. 4,325 ft.
Vacuum Oil Co.'s No. 1 Grisham-Hunter — Rigging up.
World Oil Co.'s No. 1 Biggs, C SE Sec. 85, Blk. 112, Public School Land Sur., elev. 3,068 ft. — Shut down 1,657 ft.; moving in tools to deepen.
World Oil Co.'s No. 1 Duff, 1,500 ft. from S and 850 ft. from NE lines, R. S. Johnson Sur. No. 68, elev. 2,774 ft. — Top Delaware lime 4,185 ft.; hole full brackish salt water 4,368-4,500 ft.; plugged back to 4,237 ft.; shot 70 qts. 4,185-4,225 ft.; little oil in hole; cleaning out to bottom.

RUNNELS COUNTY

Empire G. & F. Co.'s No. 1 C. C. Gray — Hole full salt water 2,250-57 ft.; Shut down 2,365 ft.
Gibson & Johnson's No. 1 Harris Est., Juliana Voske Cabrera Sur. — Location.
Gibson & Johnson's No. 1 H. P. Serratt, C SE NW Sec. 150, E. T. R. R. Sur. — Rig up.
Kennedy et al's No. 1 J. E. Tally — Shut down 1,720 ft.
May et al's No. 1 J. M. Schneider, John Wall Sur. — ½ bailer salt water 1,032 ft.; hole full water 1,100-20 ft.; drlg. 1,162 ft.
Miles Oil Co.'s No. 1 Charles Ray, Sec. 21, T. & N. O. Sur. — Cellar and machine.
Miles Oil Co.'s No. 1 L. S. Lawhon, NE cor. Sec. 68, — Show gas 960-80 ft.; shut down for 6-in. 2,310 ft.
Noble O. & G. Co.'s No. 1 Sims, Sec. 12, J. J. McHenry Sur. — Hole full sulphur water 2,710-20 ft. and hole full salt water 2,820 ft.; shut down 3,506 ft.
Royal Pet. Co.'s No. 1 A. C. Willingham — Shut down 450 ft.
Sillix Pet. Co.'s No. 1 Malone — Location.
Swensondale Oil Co.'s No. 1 E. A. Werner — Drlg. 2,010 ft.; hole full water 2,000 ft.
Vacuum Oil Co.'s No. 2 R. M. McMillan — Spudding.
Watchorn O. & G. Co.'s No. 1 J. L. King — Hole full salt water 1,683-91 ft.; setting 8-in. 2,000 ft.

SCHLEICHER COUNTY

Beavers & Leath et al's No. 1 J. A. and W. T. Whitten, C NW Sec. 35, Blk. 11, T. O. Sur. — Shut down 400 ft.
Thomas Grey et al's No. 1 Ball Robinson, C NW Sec. 25, Blk. M., G. H. & S. A. Sur. — Sulphur water 2,125 ft.; hole full water 2,160-80 ft. and 2,935 ft.; total depth 3,150 ft.

SCURRY COUNTY

J. B. Mims et al's No. 1 J. J. Koonsman, Sec. 220, Blk. 2, H. & T. C. Sur. — Rig.

STERLING COUNTY

Orr et al's (to be taken over by Empire G. & F. Co.) No. 1 Neal Reed, CNL Sec. 15, Blk. 30, W. & N. W. Sur. — Shut down 1,390 ft. (cor.)

SUTTON COUNTY

National Potash Co.'s No. 1 J. N. Ross — Coring 960 ft.

TAYLOR COUNTY

A. J. Brown et al's No. 1 Henslee, NE cor. Sec. 5, Blk. 4, S. P. R. R. Survey — Shut down 2,360 ft.
Dorning & Perrine's No. 1 J. A. Hammer, C. N. 100 acres, Sec. 23, Blk. 19, T. & P. Sur., elev. 1,904 ft. — Shut down 455 ft.
Gilbert Johnson and Day Bros.' No. 1 C. M. Brown, Sec. 1, Blk. 6, T. & P. Sur. — Straightening hole 835 ft.
Owen & Sloan's No. 1 Lattimer, Sec. 14, Blk. 9, T. & P. Sur. — Drlg. 2,785 ft.
Roeser & Pendleton's No. 1 Sam Hutman, C W half NW Sec. 64, Blk. 5, T. & P. Sur. — Water sand 2,222 ft.; hole full water 3,025-80 ft.; total depth 3,110 ft.; underreaming 5-in.

TERRELL COUNTY

Big Bend Oil Co.'s No. 1 Bassett — Location.
Champlin Ref. Co.'s No. 1 Corder, C Sec. 110, Blk. 1, C. C. S. D. Sur. — Rigging up; ready to spud.
Deep Rock Oil Co.'s No. 1 H. C. Nolke, Sec. 4, Blk. A-2, T. C. R. R. Sur. — Rig; will spud Jan. 16.
Humble Oil Co.'s No. 1 University, Sec. 15, Blk. 34 — Drlg. 450 ft.
Milham Exploration Co.'s No. 1 Bassett, Sec. 77, Blk. Y, W. H. Robertson Sur. — Run. 10-in. 1,385 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E. L. R. R. Sur. — Slight show gas 2,230 ft.; run. 6-in. 3,207 ft.; will deepen.

TOM GREEN COUNTY

George Amery's No. 1 Wilkey, C SW Sec. 3, B. A. L. Sur. — Location.
Collins et al's No. 1 Jones, CSL Sec. 646, Shaffer Sur. — Rig.
Cox et al's No. 1 Llano — Total depth 470 ft.; shut down.
Fitzgerald & Taliaferro's No. 1 Bennett — Shut down 1,885 ft.
Marland Oil Co.'s No. 1 J. W. Johnson, C SE Sec. 6, R. B. Sanderson Sur. — Hole full water 2,020-45 ft.; drlg. 3,252 ft.
Marland Oil Co.'s No. 1 J. W. Johnson-A — Drlg. 2,420 ft. (cor.).
Tulsa Oil Co.'s No. 1 Adams, C SW Sec. 163, Blk. 11, S. P. R. R. Sur. — Shut down lime 1,020 ft.
Haulbert et al's No. 1 Johnson — Shut down 850 ft.

UPTON COUNTY

Mark Curtis et al's (was Hultz et al's) No. 2 Giddings, 5,336 ft. S and 6,678 ft. E of NW cor. Throckmorton Co. School Land, League 1, elev. 2,757 ft. — Shut down 700 ft.
Southern C. O. P. Co.'s No. 1 C. W. Hobbs — Flowed sulphur water 2,340-80 ft.; drlg. 2,920 ft.
The Texas Company and Cordova Union's No. 1 Union Land, Sec. 23, Blk. 35, H. & T. C. — Top pay 2,098 ft.; swabbed 60 bbls. in 36 hrs. at 2,271 ft., 2 per cent water; 2,200 ft. sulphur water 2,390-2,405 ft.; drlg. 2,671 ft., gray lime; hole full water.
Wise & Jackson's No. 1 J. H. Porter, SW cor. SW SW Sec. 184, Blk. E, elev. 2,592 ft. — Top pay 3,419 ft.; total depth 3,517 ft., gray lime; shut down.

VAL VERDE COUNTY

A. Blume et al's No. 1 Moore Est., Sec. 183, J. Mitchell Sur., elev. 953 ft. — Shut down 3,000 ft.
Curso Williams' No. 1 Holman, NE NE Sec. 5, Blk. N, G. H. & S. A. Sur. — Shut down 2,940 ft.
East Del Rio Oil Co.'s No. 1 Russell, SE cor. Sec. 183, Del Rio Town Sur., elev. 941 ft. — Total depth 3,190 ft.; shut down.
Magnolia Pet. Co.'s No. 1 Whitehead, Sec. 81, D. G. C. & S. F. Sur., elev. 1,770 ft. — Drlg. 5,600 ft.
Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I. & G. N. Sur., elev. 1,175 ft. — Shut down 3,900 ft.
O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I. & G. N. Sur., elev. 2,130 ft. — Gas sand 2,491-2,520 ft.; tested 125,750 ft. gas; reset 8-in. 2,511 ft.; drlg. 3,990 ft.
W. B. Thraves et al's No. 1 W. E. Wilson — Shut down 905 ft.

WARD COUNTY

Selby Oil Co. et al's No. 1 A. G. Dooley et al, Sec. 85, Blk. A, G. M. M. & A. Sur. — Fish, tools 400 ft.

WINKLER COUNTY

Amerada Pet. Corp.'s No. 1 J. B. Walton, SW cor. NW Sec. 48, Blk. 26, elev. 2,833 ft. — Built new steel rig and trying to skid over hole; total depth 2,411 ft.

Atlantic O. P. Co.'s No. 1 Ida Hendrick-B, SE cor. W half NE Sec. 44, Blk. 26 — Show gas 2,770 ft.; top pay 2,830 ft.; cleaning out 2,936 ft.; production 364 bbls.

Atlantic O. P. Co.'s No. 2 Grisham-Hunter-A, Sec. 34, Blk. B-5 — Shot.

Atlantic O. P. Co.'s No. 3 Grisham-Hunter-A, Sec. 34, Blk. B-5 — Topped salt 1,315 ft.; fish. 2,535 ft.

Atlantic O. P. Co.'s No. 4 Grisham-Hunter-A, Sec. 34, Blk. B-5 — Top salt 1,470 ft.; top lime 2,472 ft.; run. 8-in. 2,477 ft.

Atlantic O. P. Co.'s No. 1 Grisham-Hunter-C (was Lemar) SW cor. Sec. 40, Blk. B-5 — Drlg. 2,903 ft.

Atlantic O. P. Co.'s No. 1 Grisham-Hunter-E, SW cor. N half NE Sec. 41, Blk. B-5 — Drlg. 2,666 ft.

Atlantic O. P. and Collett's No. 1 Ida Hendrick-F, NE cor. W half NW Sec. 40, Blk. 26 — Rigging up cable tools 2,446 ft.

V. T. Bolin et al's No. 1 Brown — Spudded and shut down.

Magnolia Pet. Co.'s (was G. M. Church et al's) No. 2 Ida Hendrick — Show oil 2,750 ft.; top pay 2,865 ft.; deepened from 2,955 ft. to 2,961 ft., flowing 90 per cent water.

Magnolia Pet. Co.'s No. 3 Ida Hendrick — Cem. 8-in. 2,425 ft.; drlg. 2,575 ft.

Cranfill Bros. and California Co.'s No. 1 M. J. Bashara, at cor. Secs. 10, 11, 22 and 23, School Blk. 77 — Total depth 3,503 (s.l.m.); shut down for orders.

Cranfill & Reynold's No. 1 Grisham-Hunter-B, Sec. 35, Blk. B-5 — Show oil 2,650-55 ft.; top pay 2,845 ft.; total depth 3,080 ft.; preparing to shoot; makes 126 bbls.

Cranfill & Reynolds' No. 1 Hendrick-C — Drlg. 2,345 ft.

Eastland Oil Co. and Arnold's No. 1, Sec. 35, Blk. B-5 — Show oil 2,675 ft.; shut down 2,755 ft.; est. 20,000,000 ft. gas and spraying oil; flowing water between casing from Republic's No. 1-B.

Gulf Prod. Co.'s No. 2 T. G. Hendrick, NE NW NW Sec. 34, Blk. B-5 — Rig standing.

Gulf Prod. Co.'s No. 8 T. G. Hendrick, Sec. 34 — Total depth 1,641 ft.; recementing 12-in.

Gulf Prod. Co.'s No. 9 T. G. Hendrick, Sec. 34 — Last returns 1,470 ft.

Gulf Prod. Co.'s No. 10 T. G. Hendrick, SW cor. NE Sec. 45, Blk. 26 — Drlg. 1,520 ft.

Humble O. & R. Co.'s No. 1 T. G. Hendrick, NW cor. NE Sec. 34, Blk. B-5, Public School Land, elev. 2,816 ft. — Total depth 2,927 ft.; flowed 282 bbls. hr.

Humble O. & R. Co.'s No. 3 Hendrick, Sec. 34, Blk. B-5 — 5,000,000 ft. gas from 2,195 ft.; spraying 25 bbls. oil and est. 20,000,000 ft. gas at 2,898 ft.; working pipe.

Humble O. & R. Co.'s No. 5 Hendrick, SW cor. NE Sec. 34, Blk. B-5 — Top lime 2,398 ft.; drlg. 2,810 ft.

Humble O. & R. Co.'s No. 6 Hendrick — Building rig.

Humble O. & G. Co.'s No. 2 Ida Hendrick-B, Sec. 29 — Top salt 1,353 ft.; drlg. 2,074 ft.

Independent O. & G. Co.'s No. 3 Grisham-Hunter, Sec. 34 — Location.

Independent O. & G. Co.'s No. 4 Grisham-Hunter — Location.

Independent O. & G. Co.'s No. 5 Grisham-Hunter — Top salt 1,541 ft.; fish. 1,970 ft.

Independent O. & G. Co.'s No. 6 Grisham-Hunter — Top salt 1,450 ft.; stand. cem. 2,605 ft.

Independent O. & G. Co.'s No. 7 Grisham-Hunter — Rigging up cable tools 2,588 ft.

Independent O. & G. Co.'s No. 8 Grisham-Hunter — Drlg. 1,100 ft.

Independent O. & G. Co.'s No. 1 Vardeman-B, SE cor. E half NW Sec. 41, Blk. B-5 — Top salt 1,775 ft.; top pay 2,575 ft.; drlg. 2,680 ft.; flowed 395 bbls.

Independent O. & G. Co.'s No. 2 Vardeman-B — Drlg. 635 ft.

Independent O. & G. Co.'s No. 3 Vardeman-B — Drlg. 560 ft.

Independent O. & G. Co.'s No. 4 Vardeman-B — New location; cellar.

Liner Drlg. Co.'s No. 1 Seth-Campbell, NE cor. Sec. 2, Blk. B-5 — Shut down 450 ft.

Landreth Prod. Corp.'s No. 1 Hendrick-A, SE cor. SW Sec. 29, Blk. B-5 — Total depth 3,013 ft.; aver. 36 bbls. daily past week; clean. out to deepen; fish. for bit.

Landreth and Roxana's No. 2 Ida Hendrick-A, Sec. 29, Blk. B-5 — Partly rigged and shut down.

Landreth and Roxana's No. 3 Ida Hendrick-A, Sec. 29, Blk. B-5 — Rigging up machine 2,625 ft.

Magnolia Pet. Co.'s No. 3 Ida Hendrick — Drlg. 2,670 ft.

Magnolia Pet. Co.'s No. 4 Ida Hendrick, Sec. 29, Blk. B-5 — Drlg. 2,820 ft.

Magnolia Pet. Co.'s No. 5 Ida Hendrick — Stand. cem. 2,518 ft.

Magnolia Pet. Co.'s No. 6 Ida Hendrick, Sec. 29, Blk. B-5 — Top salt 1,430 ft.; drlg. 1,760 ft.

Murchison Oil Co. et al's No. 1 Grisham-Hunter-B, NE. cor. SW SW Sec. 35, Blk. B-5 — Standing 2,427 ft.

Murchison Oil Co. et al's No. 2 Grisham-Hunter-B — Location.

Murchison Oil Co. et al's (was Marland Oil Co.'s) No. 4 Grisham-Hunter-B — Rigging up cable tools 2,851 ft.

Mining & Engineering Co.'s No. 1 T. G. Hendrick, Sec. 10, Blk. B-12 — Partly rigged and shut down.

Murchison Oil Co. and Cranfill Bros.' No. 2 Grisham-Hunter-A — Location.

Murchison Oil Co. and Cranfill Bros.' No. 4 Grisham-Hunter — Preparing to standardize 2,855 ft.

The Texas Company's (was Pure Oil Co.'s) No. 2 Hendrick, elev. 2,827 ft. — Top salt 1,518 ft.; top lime 2,390 ft.; spraying oil with 15,000,000 ft. gas 2,657-2,825 ft.; flowed 85 bbls. first hr. from 2,657-2,880 ft.; top big pay 2,875 ft.; shut down 2,889 ft.

The Texas Company's (was Pure Oil Co.'s) No. 3 Hendrick, NE cor. SW Sec. 41, Blk. B-5 — Top pay 2,758 ft.; est. 500 bbls. oil and 25,000,000 ft. gas; tools blew out and broke control head.

The Texas Company's (was Pure Oil Co.'s) No. 1 Hendrick-B, NE cor. SE Sec. 34, Blk. B-5 — Show gas 2,350-60 ft.; show oil 2,380 ft.; 15,000,000 ft. gas at 2,490 ft.; more gas 2,564 ft.; 40,000,000 ft. gas at 2,720 ft., will run 6-in. 2,731 ft.

The Texas Company's (was Pure Oil Co.'s) No. 2 Hendrick-B — Top lime 2,387 ft.; top pay 2,808 ft.; flow, small heads; shut down for orders 2,866 ft.

The Texas Company's (was Pure Oil Co.'s) No. 3 Hendrick-B — Cem. 8-in. 2,438 ft.; 6,000,000 ft. gas 2,600 ft.; shut down for orders 2,860 ft.

The Texas Company's (was Pure Oil Co.'s) No. 4 Hendrick-B — Stand. cem. 2,405 ft.

The Texas Company's No. 5 Hendrick-B, SE SW SE Sec. 34, Blk. B-5 — Drlg. 1,002 ft.

The Texas Co.'s (was Pure Oil Co.'s) No. 6 Hendrick-B — Drlg. 900 ft.

The Texas Company's No. 1 Grisham-Hunter-C — Cem. crevice 952 ft.

Republic Prod. Co.'s No. 1-A Grisham-Hunter-B, SW cor. E half SE Sec. 41, Blk. B-5 — Shut down 2,189 ft.

Republic Prod. Co.'s No. 2 Grisham-Hunter-B — Drlg. 2,720 ft.

Republic Prod. Co.'s No. 2 Hendrick-A, NE E half SW Sec. 45, Blk. 26 — Drlg. 710 ft.

Roxana Pet. Corp.'s No. 1 Grisham-Hunter-A, SW cor. E half NW Sec. 45, School Blk. 26 — Top lime 2,428 ft.; total depth 2,880 ft.; flowed 1,810 bbls.; pinched.

Roxana Pet. Corp.'s No. 2 Grisham-Hunter-A, SE cor. E half NW Sec. 45, Blk. 26 — Drlg. 1,460 ft.

Roxana Pet. Corp.'s No. 1 Grisham-Hunter-B, SW cor. S half SE Sec. 29, Blk. B-5 — Top lime 2,657 ft.; show oil and gas 2,630 ft.; drlg. 3,018 ft.

Roxana Pet. Corp.'s No. 2 Grisham-Hunter-B — Drlg. 2,620 ft.

Roxana Pet. Corp.'s No. 3 Grisham-Hunter-B — Drlg. 230 ft.

Roxana Pet. Corp. No. 2 Grisham-Hunter-C, SE cor. N half NW Sec. 29, Blk. B-5 — Top salt 1,405 ft.; showed oil 2,880-83 ft., 2,910-14 ft. and 2,919-36 ft.; top pay 2,948 ft.; total depth 2,989 ft.; flowed 320 bbls. per hr. open, 33 per cent water; pinched to 3,540 bbls., 1 per cent water; shut in to plug back.

Roxana Pet. Corp.'s No. 3 Grisham-Hunter-C — Top salt 1,571 ft.; top lime 2,527 ft.; drlg. 2,610 ft.

Roxana Pet. Corp.'s No. 4 Grisham-Hunter-C — Drlg. 2,590 ft.

Roxana Pet. Corp.'s No. 5 Grisham-Hunter-C — Top lime 2,588 ft.; stand. cem. 2,611 ft.

Roxana Pet. Corp.'s No. 1 Grisham-Hunter-D, SW cor. S half NE Sec. 41, Blk. B-5 — Show oil and gas 2,504 ft.; top pay 2,791 ft.; flowed est. rate 10,000 bbls.; pinched to 1,972 bbls. on ⅝-in. choke.

Roxana Pet. Corp.'s No. 2 Grisham-Hunter-D — Top salt 1,340 ft.; drlg. 1,866 ft.

Sheldon & Burden's No. 1 Ida Hendrick, SW cor. SE Sec. 28, Blk. B-5 (10-a. tract) — Top salt 1,260 ft.; top lime 2,609 ft.; show oil 2,730 ft. and 2,820 ft.; drlg. 2,890 ft.

Southern C. O. P. Co.'s No. 2 Ida Hendrick T-88-B — Total depth 2,659 ft.; cem. 6-in. in lime; stand. cem.

Southern C. O. P. Co.'s No. 2 T-89 Grisham-Hunter-A, Sec. 35, Blk. B-5 — Standardizing 2,301 ft.

Southern C. O. P. Co.'s No. 3 T-89-A Grisham-Hunter-A — Shut down 2,352 ft. (cor.).

Southern C. O. P. Co.'s No. 4 T-89-A Grisham-Hunter-A — Location; rotary moved away.

Texon O. & L. Co.'s No. 2 Grisham-Hunter-A — 5,000,000 ft. gas 2,260-2,500 ft.; 15,000,000 ft. gas 2,646-56 ft.; total depth 2,725 ft.; rig was wrecked when gas blew tools out of hole; est. 20,000,000 ft.

Texon O. & L. Co.'s No. 3 Grisham-Hunter-A, NW cor. W half SE Sec. 41, Blk. B-5 — Cem. 2,140 ft.

Texon O. & L. Co.'s No. 1 Grisham-Hunter-B, NW cor. W half SW Sec. 45, School Blk. 26 — Drlg. 2,570 ft.

Texon O. & L. Co.'s No. 2 Grisham-Hunter-B, NE W half SW Sec. 45, Blk. 26 — Shut down for storage 2,810 ft.; made 285 bbls.

White Eagle O. & R. Co.'s (was Gibson & Johnson's) No. 1 P. A. Lock, 1,320 ft. W of NE cor. Sec. 30, Blk. 74, NW of discovery well, elev. 2,830 ft. — Total depth 3,260 ft.; shut down after trying to cem. off baller.

Southern C. O. P. Co.'s No. 1 Ida Hendrick 3-T-67-A, C SW NW NE Sec. 4, Blk. B-12, elev. 2,784 ft. — Top lime 2,638 ft.; slight show oil 3,000-08 ft.; filled up 1,500 ft. sulphur water at 3,065-72 ft.; plugged back to 3,050 ft.; water now shut off; shut down waiting orders.

Southern C. O. P. Co.'s No. 2 Ida Hendrick 3-T-67-A — Standardizing 2,646 ft. and shut down.

Southern C. O. P. Co.'s No. 2 T-67 Ida Hendrick-F — Top salt 1,715 ft.; cem. 6-in. 2,207 ft.

Southern C. O. P. Co.'s No. 3 T-67 Ida Hendrick-F — Top salt 1,702 ft.; top lime 2,688 ft.; stand. cem. 2,694 ft.

Southern C. O. P. Co.'s No. 4 T-67 Ida Hendrick-F — Top salt 1,800 ft.; top lime 2,700 ft.; stand. cem. 2,701 ft.

Southern C. O. P. Co.'s No. 5 T-67 Ida Hendrick-C — Drlg. 2,600 ft.

Southern C. O. P. Co.'s No. 1 T-67 Hendrick-B, NE cor. SE Sec. 24, Blk. 26 — Top salt 2,210 ft.; top lime 2,645 ft.; total depth 2,648 ft.; drlg. 3,063 ft.

Southern C. O. P. Co.'s No. 2 T-67 Hendrick-B — Cem. 12-in. 356 ft.

Southern C. O. P. Co.'s No. 1 Hendrick 3-T-68-A, SW cor. W half NW Sec. 35, Blk. B-5 — Top salt 1,365 ft.; top lime 2,303 ft.; top pay 2,440 ft.; shut down 2,740 ft.; no production; tools bridged hole; est. 90,000,000 ft. gas.

Southern C. O. P. Co.'s No. 2 Hendrick 3-T-68-A — Standardized 2,288 ft.; drlg. plug 2,289 ft.

Southern C. O. P. Co.'s No. 3 Hendrick 3-T-68-A — First gas 2,400 ft.; 8,000,000 ft. gas 2,420 ft.; drlg. by tools 2,420 ft.

Southern C. O. P. Co.'s No. 1 T-88 Ida Hendrick-C, NW cor. Sec. 28, Blk. B-5 — 6,000,000 ft. gas 2,665 ft.; total depth 2,880 ft.; jarring on tools.

Southern C. O. P. Co.'s No. 4 Ida Hendrick, T-88-C — Cem. 6-in. 2,586 ft. and rigging cable tools.

Southern C. O. P. Co.'s No. 5 Ida Hendrick, T-88-C — Drlg. 2,470 ft.

Southern C. O. P. Co.'s No. 6 Ida Hendrick, T-88-C — Drlg. 2,545 ft.

Southern C. O. P. Co.'s No. 7 Ida Hendrick, T-88-C — Show gas 2,600 ft.; drlg. 2,680 ft.

Turman & Maxwell's No. 1 Ida Hendrick — Shut down for tankage 2,860 ft. (s.l.m.); flows about 35 bbls. and 5,000,000 ft. gas; rigging cable tools.

Turman & Maxwell's No. 2 Ida Hendrick — 10,000,000 ft. gas 2,865 ft.; drlg. 2,915 ft.; aver. 800 bbls. past wk.

Turman & Maxwell's No. 3 Ida Hendrick, E half NE Sec. 29, Blk. B-5 — Drlg. 2,585 ft.

Turman & Maxwell's No. 4 Ida Hendrick — Shut down 1,115 ft.

Turman & Maxwell's No. 5 Hendrick, SE cor. E half NE Sec. 29, Blk. B-5 — Location.

Turman & Maxwell's No. 6 Hendrick, NW cor. E half NE Sec. 29, Blk. B-5 — Location.

Turman & Maxwell's No. 7 Hendrick — Stand. cem. 2,375 ft.

Turman & Maxwell's No. 8 Hendrick — Top salt 1,260 ft.; drlg. 2,026 ft.

Southern C. O. P. Co.'s No. 1 Ida Hendrick, T-88-G, SW SE Sec. 28, Blk. B-5 — Rigging up rotary.

Southern C. O. P. Co.'s No. 1 T-88 Hendrick-H — Drlg. 512 ft.

Southern C. O. P. Co.'s No. 2 T-88 Hendrick-H — Rigging up.

Southern C. O. P. Co.'s No. 2 T-88 Hendrick-A — Rigging up rotary.

Southern C. O. P. Co.'s No. 1 Ida Hendrick, T-88-I, SE cor. E half NE Sec. 30, Blk. B-5 — Cem. 6-in. 2,661 ft.; standardizing.

Southern C. O. P. Co.'s No. 1 E. G. Hutchings, T-90, NE cor. E half SE Sec. 47, Blk. 26, elev. 2,835 ft. — Top salt 935 ft.; top lime 2,340 ft.; run. 8-in.; will cem. with 500 sacks.

Gibson-Johnson & Kesler-Logan's No. 1 Daugherty, SW cor. NE SW Sec. 3, Blk. 74, School Land — Moving in material.

Llano Oil Co.'s No. 1 F. B. Armstrong, at common cor. Secs. 12, 13, 18, and 19, Blk. B-6, School Land. — Location.

Roxana Pet. Corp. and Llano Oil Co.'s No. 2 W. F. Scarborough, SW cor. NE Sec. 1, Blk. C-22, School Land — Rigging up; drilling water well.

WILDCAT OPERATIONS IN PANHANDLE

(Continued from Page 40)

Empire G. & F. Co.'s No. 1 S. A. Cobb, NW cor. NE. Sec. 64, Blk. 25, H. & G. N. Sur. — Location.

Empire G. & F. Co.'s No. 1 C. A. Bell, C SE, Sec. 134, Blk. 3, I. & G. N. Sur. — Location.

Gardner et al's No. 1 G. H. Saunders — Rig.

Gibson Oil Corp.'s No. 2 J. B. Bowers — Stdzing., 2,805 ft.

Gibson Oil Corp.'s No. 3 J. B. Bowers, 1,650 ft. from E. line and 990 feet from S line, E half, Sec. 92, Blk. B-2 — Location.

Gulf's No. 2 Bowers, 990 ft. from S. line and 330 ft. from W. line of W half, Sec. 89, Blk. B-2, H. & G. N. Sur. — T.D., 2,939 ft. lime; drilled plug and 45,000,000 ft. gas came back.

Gulf's No. 3 Bowers, 330 ft. from SE cor. W half, Sec. 89 — T.P. in soft G.W., 2,900-18 ft; flowed 850 bbls. first 6 hrs.; now 140 bbls. per hr.

Gulf's No. 2 Holmes, SE cor. NE, Sec. 107, Blk. 3, I. & G. N. Sur. — Drlg., 1,920 ft.

Gulf Prod. Co.'s No. 1 M. Davidson-A, 330 ft. from S and E lines of NW cor. E half NW, Sec. 87, Blk. B-2, H. & G. N. Sur. — Moving in tools.

Gurnsey Oil Co.'s No. 1 B. E. McKinney, 1,980 ft. E. and 800 ft. N. of SW cor. Sec. 163, Blk. 3, I. & G. N. Sur. — 15,000,000 ft. gas, 3,026-3,110 ft; show oil, 3,270 ft; drlg., 3,300 ft. and making 1 bailer wtr. per hr.

Gurnsey Oil Co.'s No. 2 B. E. McKinney, Sec. 163, Blk. 3, I. & G. N. Sur. — Drlg., 1,100 ft.

Collins & Gardners (formerly Lefors Pet. Co.'s) No. 1 J. Shaw, Lefors townsite — 10,000,000 ft. gas, 2,440-50 ft; 70,000,000 ft. gas, 2,625 ft; T.D., 2,650 ft; trying to pull 8-in. and it parted; rigging up.

M. O. & G. Oil Co.'s (formerly H. C. McCauley et al's) No. 1 J. Morse, Sec. 2, Blk. 46, H. & G. N. Sur. — Top lime, 1,770 ft; 10,000,000 ft. of gas at 2,352-65 ft., show of oil 2,400 ft; gas inc. 2,000,000 ft., 2,435 ft; stvgd. 107 bbls. first 24 hrs., 3,054-64 ft; may complete here; now flowing 240 bbls. daily.

McAuley et al's No. 1 Morse, SE cor. N half, Sec. 3, Blk. 26, H. & G. N. Sur. — Location.

Empire G. & F. Co.'s No. 1 Bender, SE cor. Sec. 164, Blk. 3, I. & G. N. Sur. — Spud.

Majestic Oil Co.'s No. 4 J. B. Bowers, SW cor. E half, Sec. 92, Blk. B-2 — Building rig.

Magnolia Pet. Co.'s No. 1 J. Bowers — Fish. for tools, 2,085 ft.

Magnolia Pet. Co.'s No. 1 J. J. Wall, NE cor. Sec. 162, Blk. 3, I. & G. N. Sur. — Drlg., 1,480 ft.

McMan Oil & Gas Co.'s No. 1 Osborne, NE cor. W half SE, Sec. 86, Blk. 3, I. & G. N. Sur. — Rigging up.

Midwest Explt'n. Co.'s No. 1 J. Bowers, NW cor. W half SW, Sec. 63, Blk. B-2, H. & G. N. Sur. — Topped G.W., 2,785 ft; show oil, 2,958 ft; flowed 810 bbls. first 24 hrs., 3,054-64 ft; may complete here; now flowing 240 bbls. daily.

Midwest Explt'n. Co.'s No. 1 L. Holmes, Sec. 86, Blk. 3, I. & G. N. Sur. — Drlg., 1,062 ft.

Neudigate et al's No. 1 A. Chapman, NE cor. E ½, SE, Sec. 52, Blk. 25 — 500,000 ft. gas, 2,760-65 ft; rainbow of oil, 2,820-25 ft; salt wtr; G.W., 2,827-28 ft; S.D., 2,835 ft.

Operators Oil Co.'s No. 1 Jackson — Flowed 1,800 bbls. in 24 hrs. from best G. W. pay, 2,967-84 ft., running 5-in to 2,990 ft. S. L. M. C.O.

Operators Oil Co.'s No. 2 W. Jackson, NW cor. N ½ NE, Sec. 88, Blk. B-2 — Rigged and S.D.

Phillips Pet. Co.'s No. 1 Davidson (Myson) — Cmted. 12½-in. csg., 965 ft.

Phillips Pet. Co.'s No. 2 Davidson (Myson) NE cor. NW NW, Sec. 87, Blk. B-2, H. & G. N. Sur. — Cellar.

Phillips Pet. Co.'s No. 1 W. Jackson (was Clark et al's No. 2) — S.O., 2,890 ft; swab. 240 bbls. daily, 2,905-39 ft; to drill deeper.

Phillips Pet. Co.'s No. 2 W. Jackson (was Clark et al's No. 3) — T.D., 2,994 ft; swabbing 60 bbls. daily; to D.D.

Phillips Pet. Co.'s No. 3 W. Jackson — Drlg., 2,200 ft.

Phillips Pet. Co.'s No. 1 Jackson-Riley (was Clark et al's No. 1 W. Jackson) — 7,000,000 ft. gas, 2,442-2,545 ft; swabbed 160 bbls. at 2,981 ft. T.D., 3,010 ft; to D.D.

Phillips Pet. Co.'s No. 2 Jackson-Riley — Fish., 2,310 ft.

Phillips Pet. Co.'s No. 3 Jackson Riley, Sec. 88, Blk. B-2, H. & G. N. Sur. — Drlg., 412 ft.

Phillips Pet. Co.'s No. 4 Jackson-Riley, SE cor. W half SW, Sec. 88, Blk. B-2 — Location.

Pampa Oil Co.'s No. 1 W. R. Campbell, Sec. 90, Blk. 3 — Drlg. 3,433 ft.; 700 ft water. 3,430 ft; S.D., 3,432 ft.

Purple Sage Oil Co.'s No. 2 E. B. Johnson — S.D., 525 ft.

Ray & Massie's No. 1 A. Chapman, NE NW SW, Sec. 51, Blk. 25 — Rotary rig.

Rensaul Pet. Co.'s No. 2 M. Huselby, NE cor. SW, Sec. 55, Blk. 25, H. & G. N. Sur. — Location.

Remo Oil Co.'s No. 1 B. E. McKinney — Rigged up and S.D.

St. Clair Oil Co.'s No. 1 C. H. Rowe — Spud. and S.D.

St. Clair Oil Co.'s No. 1 L. S. Stocklon, SE cor. Sec. 35, W. R. Lee Sur. — Rig on ground.

Shamrock Pet. Co. et al's No. 1 J. B. Back, SE NW SW, Sec. 44, Blk. 25 — Show gas, 2,490 ft; drlg., 2,920 ft.

Shamrock Oil Co.'s No. 1 Chapman, NE E half SW, Sec. 50, Blk. 25 — Drlg., 512 ft.

Skelly Oil Co.'s No. 1 Bradford, NE cor. Sec. 118, Blk. B-2, H. & G. N. Sur. — Cmtd. 12½-in. csg., 1,050 ft.

Skelly Oil Co.'s No. 1 W. Jackson — 7,000,000 ft. gas, 2,780 ft. S. O. at 2,865-70 ft; exhausted little fresh wtr., 3,012 ft; swbd. 10 bbls. daily, 2,865-70 ft.

Skelly Oil Co.'s No. 2 Jackson — 1,000,000 ft. gas, 2,695 ft; fish. for bit, 2,895 ft.

Spartan Oil Co.'s No. 1 J. Hopkins — Rig.

Sullivan et al's No. 1 A. Chapman-A — Drlg., 720 ft.

Sun Oil Co.'s No. 1 Jackson — Top lime, 2,035 ft; drlg. lime, 2,330 ft.

Staggers Oil Co.'s (was Ruby Oil Co.'s) No. 1 B. F. Tally — T.D., 635 ft; S.D.

The Texas Company's No. 2 J. B. Bowers — Show gas, 2,810 ft; show oil, 2,820 ft; drlg., 2,890 ft.

The Texas Company's No. 3 J. B. Bowers — Drlg., 1,420 ft.

The Texas Company's No. 4 J. B. Bowers, SE cor. SE, Sec. 93, Blk. B-2 — Rigging up.

The Texas Company's No. 2 H. M. Davis, SW cor. NW, Sec. 86, Blk. 3 — Drlg., 1,000 ft.

The Texas Company's No. 1 McLarty et al, SW cor. E ½ NW, Sec. 1, Blk. 1, A. C. H. & B. Sur. — Rigging up.

The Texas Company's No. 1 S. McLarty — Drlg., 265 ft.

The Texas Company's No. 4 G. H. Saunders — 6,000,000 ft. gas, 2,495 ft; set 6-in., 2,673 ft; T.D., 2,727 ft; 2,000 ft. oil from G.W., 2,720-25 ft; putting on pump.

The Texas Co.'s No. 1 W. H. Taylor, CNE, Sec. 10, Blk. B-2, (formerly Smallwood et al's) — Rig.

HALE COUNTY

Bailey & Young's No. 1 Thomas, Sec. 1, Blk. J.K.L. — S.D., 175 ft.

Donnell Pet. Co.'s No. 2 Mullican, NW cor. Sec. 66, Blk. A-3 I. & S. B. Sur. — Top pay in sandy shale, 405 ft; ½ bailer oil and 3 bailers wtr. per day; S.D., 620 ft.

Donnell Pet. Co.'s No. 1 Mullican, C Sec. 21, Blk. B, R. M. Thompson Sur. — 200 ft. fluid in hole from 407-14 ft; S.D.

Explt'n. Co.'s No. 1 Crawford, C NE, Sec. 17, Blk. C-3, T. T. R. R. Sur. — Spudded and S.D.

Explt'n. Co.'s No. 1 Goodman — Spudded and S.D.

A. S. Mimm's No. 1 W. A. Ritcher, 700 ft. from east line and 1,200 feet from south line, Sec. 17, Blk. X, John Glynn Sur. — S.D., 1,140 ft.

Tolbert & Simms' (was Gouldy & Stone's) No. 1 Kitteral, SE cor. NW, Sec. 65, Blk. A-3, G. C. & S. F. Sur. — S.D., 485 ft.

HALL COUNTY

Briscoe Oil Assn.'s (was Seifert et al's) No. 1 Owens, C NE, Sec. 179, Blk. S-5, Dennison & Pacific Sur. — Spudded and S.D

HANSFORD COUNTY

Caldwell et al's No. 1 J. Adriance est. — S.D. for pipe, 645 ft.

Oklavania et al's No. 1 Coots, Sec. 13, Blk. 45, H. & T. C. Sur. — S.D., 560 ft.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood — S.D., 1,455 ft. to install rotary.

HARTLEY COUNTY

Deep Rock Oil Co.'s No. 1 Lymann & Balfour, Sec. 9 — Preparing to abd., 4,038 ft.

Ealick et al's No. 1 J. R. Irving, Sec. 13, Blk. 13 — Topped G.W., 3,103 ft; show oil, 3,226 ft; hole full wtr., 3,745-55 ft; S.D., 4,000 ft.

HEMPHILL COUNTY

Hoover et al's No. 1 Schaller est., Sec. 4 — Spudded and S.D.

Hoover et al's No. 1 fee, J. S. Hood Sur. — S.D., 4,865 ft.

HUTCHINSON COUNTY

R. G. Barnum et al's No. 1 Garland Sanford, Sec. 78, Blk. 46 — Rig.

Beam et al's No. 1 Cockrell, Sec. 3, Blk. 23 — S.D., 405 ft. for orders.

Big Coach Oil Co.'s No. 1 Dunnaway, Sec. 5, Blk. Y — S.D., 750 ft.

El Rio Oil Co.'s No. 1 Cockrell, 330 ft. SE cor. W 40 SE 80 N 320, Sec. 4, Blk. 23, B. S. & F. Sur. — Spray oil, 2,975-80 ft; swab. 10 bbls., 3,040-75 ft; show wtr., 3,112-16 ft; C.O., 3,116 ft; plugging back.

Conklin et al's No. 1 Johnson, Sec. 1, Blk. X03, H. & O. B. Sur. — S.D., 600 ft.

Harris et al's No. 1 J. Q. Bost, Sec. 10, Blk. Y-2, T. T. R. R. Sur. — R.U. to drill deeper.

Holmes & Quinn's No. 1 J. K. Quinn, SW cor. Sec. 9, Blk. 3, B. S. & F. Sur. — Rig, U. S. D.

McMan O. & G. Co.'s No. 1 Albert Yake, SW cor. SE, Sec. 2, Blk. J, H. & G. N. Sur. — Drlg., 2,304 ft.

Phillips Pet. Co.'s No. 12 Elva-Whittenburg, E. Tomlinson Sur — T.A., 4,445 ft.

Phillips Pet. Co.'s No. 1 Perkins-Hamilton, SW cor. of N 240 acres of S half, Sec. 22, Blk. 47, H. & T. C. Sur. — Loc.

Skelly Oil Co.'s No. 2 Armstrong & Byrd — Drlg., 563 ft.

Skyrocket Oil Co.'s No. 1 Mrs. R. A. Jameson — 800 ft. oil in hole from 3,146 ft; drilled to 3,180 ft; shot with 60 qts., 3,125-60 ft; bridged; no increase in oil after deepening.

The Texas Co.'s No. 1 Cockrell-B, Sec. 3, Blk. B-3 — T.P., 3,015 ft; 500 ft. oil in hole; run liner, 3,040 ft; C.O., 3,121 ft.

Timms et al's No. 1 C. R. Garner — Top lime, 2,444 ft; show gas, 2,908 ft; topped pay in lime, 3,020 ft; T.D., 3,115 ft; swb. 150 bbl. daily.

KING COUNTY

Humble O. & R. Co.'s No. 1 Pitchfork, Sec. 171, Blk. A-96, John H. Gibson Sur. — Hole full wtr., 3,375 ft; U.R. 8-in. csg., 3,435 ft; drlg., 3,459 ft.

J. L. Pattison's No. 1 Patton — Slight show gas, 2,115-30 ft.; fish 3,410 ft.

LAMB COUNTY

Dan Freel et al's No. 1 Ellwood, CWL S.ec. 9, Blk. T. T. A. Thompson Sur. — Spudded and S.D.

Spade Oil Co.'s No. 1 Andrews, 1,085 ft. from N line and 200 ft. from E line, Labor 23, League 643, (5 miles NE of Littlefield) — Spud and S.D.

Tolbert & Simms' No. 1 Ellwood, NE SW SW, Sec. 14, Blk. B. R. M. Thompson Sur. — 712 ft; small show oil and hole full wtr.; dry, 1,504 ft; temp. abd.

LIPSCOMB COUNTY

Cal-Tex's No. 1 Bradford, C NE NE, Sec. 899, Blk. 43, H. & T. C. Sur. — Spudded and S.D.

Camp Creek Oil Co.'s No. 1 Mrs. H. D. May, Sec. 612, Blk. 43 — S.D., 2,000 ft.

McCorkle's No. 1 A. Barton, NE cor. SW SE, Sec. 504, Blk. 43, H. & T. C. Sur. — Wtr. in lime, 4,126-40 ft; 6-in set. 4,155 ft; 5 3-16-in. csg. set at 4,420 ft; drlg., 4,666 ft.

Ozark Drlg. Co.'s No. 1 Frass, NE SE, Sec. 106, Blk. 10, H. & T. C. Sur. — Rig on ground.

Smith, Kinsley & Ruby's No. 1 C. W. Jones, NE cor. SW, Sec. 100, Blk. 43 — Show oil, 3,520 ft; S.W., 3,900 ft; S.D. in lime and blue shale, 4,355 ft. for 6-in.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles ranch — Small show oil, 1,133-40 ft., in sand; shut down 2,730 ft.

MOORE COUNTY

Amarillo Oil Co.'s No. 1 Thompson-Amarillo, Cen. Sec. 22, Blk. 26, E. L. & R. R. Sur. — Building rig.

Prairie and Shamrock's No. 2 Gober, Sec. 16, Blk. M-21 — T.D., 2,520 ft; recmt. 12-in., 1,525 ft; drlg. by tools.

MOTLEY COUNTY

Explt'n. Co.'s No. 1 Burleson — Spudded and S.D.

Explt'n. Co.'s No. 1 Tillson — S.D., 750 ft. for repairs.

Explt'n. Co.'s No. 1 Matador Land & Cattle Co., C SW, Sec. 37, John Gibson Sur. — S.D., 1,002 ft.

Wheeler et al's No. 1 C. D. Bird, C NE, Sec. 4, Blk. S, Stephens Sur. — Spudded and S.D.

OLDHAM COUNTY

Prairie O. & G. Co.'s No. 1 Landegrin, SE cor. NE SW, Sec. 46, League 310, Capital land — 1,900 ft. wtr., 4,085-93 ft; 1 bailer wtr. per hr. and light scum oil, 4,527 ft. (steel line meas.) cmt. 6-in., 4,442 ft; 2,000 ft. S.W., 4,850-56 ft; fish., 5,307 ft.

OCHILTREE COUNTY

W. G. Burton's No. 1 Strickler — S.D., 3,940 ft.

Hamilton et al, H. E. Wamble — Shut down, 250 ft.

McCorkle P. L. Co.'s No. 1 R. H. Moore — Shut down, 1,600 ft.

Montgomery's No. 1 Weinett — Shut down, 850 ft.

Standard Development Co.'s No. 1 Bowen — Shut down, 900 ft.

POTTER COUNTY

Amarillo Oil Co.'s No. 1 Masterson-K, C SW, Sec. 85, Blk. O-18, D. & P. R. R. Sur. — Spudding.

Amarillo Oil Co.'s No. 1 Fuqua, C NW, Sec. 18, Blk. 6, B. S. & F. Sur. — Moving in rig.

Frank Allen et al's No. 1 W. H. Bush — S.D., 300 ft.

Prairie O. & G. Co.'s No. 2 Lee Bivins, 660 ft. N. and 330 ft. W. of SE cor. Sec. 39, Blk. M-20, G. & M. Sur. — Set. 10-in., 1,885 ft; drlg., 2,251 ft.

RANDALL COUNTY

Westbrook Oil Co.'s No. 1 J. Beckman, SW cor. SE NE, Sec. 46, Blk. B-5 — S.D., 1,415 ft. for casing.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Mrs. H. Ledrick & Sons, Sec. 7, Blk. 5-A — Show gas, 4,990 ft; show oil, 4,992 ft; csg. set, 4,992 ft; T.D., 5,153 ft; U.R., 308 ft. off bottom.

SHERMAN COUNTY

Gibson Oil Co.'s No. 1 Bivins, Sec. 35, Blk. 3-B — 100,000 ft. gas, 2,016-26 ft; T.D., 3,353 ft; 2,000 ft. S.W., 3,325-33 ft; fish., 3,353 ft.

Phillips Pet. Co. and Prairie O. & G. Co.'s No. 1 Price & Fuqua, C NE, Sec. 33, Blk. 2-B, G. H. & H. Sur. — 100,000 ft. gas, 2,105-10 ft; T.D., 3,420 ft; 2,000,000 ft. gas, 3,325-3,420 ft. lime; 400 ft. wtr. in hole from 3,535 ft; run. 6-in. csg. to 3,550 ft.

WHEELER COUNTY

E. L. Arnold's No. 1 M. J. Williams — Completed as gas well, 1,785 ft.

Byrens et al's No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H. & G. N. Sur. — S.D., 710 ft.

Clark et al's No. 1 J. W. Gordon — 5,000,000 ft. gas, 1,768 ft; S.D.

Rook et al's (was Foster et al's) No. 1 S. H. McDonald, SE cor. NW SW, J. N. Lindsay Sur. — Spudding and shut down.

Hatcher et al's No. 2 J. Hatcher, C NE SW, Sec. 80, Blk. 23, H. & G. N. Sur. — Drlg., 640 ft.

Mid-Kansas Oil & Gas Co.'s No. 1 J. F. Coates, Sec. 93, Blk. 17, H. & G. N. Sur. — Rig

Mid-Kansas Oil & Gas Co.'s No. 1 J. L. Newton, Sec. 92, Blk. 17, H. & G. N. Sur. — Rig.

Piney O. & G. Co.'s No. 1 W. S. Walker, Sec. 44, Blk. 24, H. & G. N. Sur. — Topped G.W., 2,305 ft; flowed 40 bbls. first 14 hrs. from G.W., 2,443-45 ft; now flowing 15 bbls. daily; drlg., 2,460 ft.

Rook & Angus' No. 1 Smock (Linkey) C SE SE, Sec. 5, Blk. 24, H. & G. N. Sur. — Rigged up and S.D.

Smith Brady et al's No. 1 P. J. Sorenson, Sec. 53, Blk. A-4 — S.D., 2,120 ft. for orders.

The Texas Company's No. 2 Morgan, Sec. 92, Blk. 17. — Run. 8-in., 1,810 ft.

Vaughan et al's No. 1 M. Ackley — Location.

Pete Woodley's No. 1 J. Boyle — S.D., 450 ft.

Vaughn et al's No. 1 B. Woodley, C SW NW, Sec. 21, Blk. 24, H. & G. N. Sur. — Location.

Vaughn et al's No. 1 A. Wood, C NW SW, Sec. 21, Blk. 24, H. & G. N. Sur. — Location.

Kaufold et al's No. 1 E. R. Wallace — Rig

Watchorn Oil & Gas Co.'s No. 2 Binkley & Caine, Sec. 92, Blk. 24, H. & G. Sur. — Drlg., 900 ft.

Woodtex Oil Co.'s No. 2 C. A. Linkey — S.D., 1,980 ft.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry.

Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

AVAILABLE CHLORIN IN BLEACHING POWDER

Please advise method for testing the strength of chloride of lime, commonly known as bleaching powder. What we want is some method of checking against the seller's specifications.—R. L. W.

The determination of chlorin requires the skill of an experienced chemist and the apparatus indicated below together with a good balance for the necessary weighing.

Prepare a representative sample from which transfer about 20 grams to a weighing bottle. Obtain the weight of this, then pour approximately 10 grams into a glass or porcelain mortar, determine by difference the exact weight of the sample, add a small quantity of water and rub with a pestle to a smooth cream. Stir in more water, let settle for a few seconds, then decant into a liter flask. Add water to the residue, rub to a cream, decant liquid as before. Repeat until all of the material has been transferred to the liter flask without loss. Now fill the flask to the mark with water, mix well, remove 50 c. c. to a beaker, add 50 c. c. of tenth normal arsenious acid. Stir rapidly, then titrate the excess with tenth normal iodine, finishing in the presence of starch indicator. The net quantity of arsenious acid represents the available chlorin. One c. c. of tenth normal arsenious acid is equivalent to 0.003546 grams chlorin.

BLENDING LUBRICATING OILS FOR VISCOSITY

We would like to know the given rule for mixing motor oils where the exact viscosity of a stock and neutral is known to obtain a given viscosity without running tests to obtain the same?—M. O. Co.

The most reliable method for calculating proportions when blending lubricating stocks to a desired viscosity appears to be by the use of graphs or blending charts. These are too large to be reproduced here. There is some information on the subject to be found in Gurwitch-Moore, Petroleum Technology, page 132. It is stated there that the viscosity of the blend never corresponds to that calculated from the proportions of the two oils mixed, but is always lower. "If the relation of the viscosity of the mixture to its composition be plotted as a graph, the abscissa representing the composition and the ordinate the viscosity, the line obtained is not a straight one between the two points representing pure constituents, but a hyperbolic curve lying under this straight line."

The blending of oils on the basis of Saybolt viscosities has been studied by Dr. W. H. Herschel of the United States Bureau of Standards and reported in Technical Paper 164. He states that the viscosity of a blend can best be estimated from the rule that the logarithms of the viscosities in poises, are additive. The larger the difference between the viscosities of the constituents, the greater the error in the logarithmic rule, the true viscosity being less than the estimated value. For equal differences of viscosity, the error increases as the viscosity of the lighter component decreases. The true viscosity will be greater than calculated on the assumption that fluidities are additive. The publication contains much discussion of the question and diagrams are given for determining the viscosity of mixtures. Directions are given for ascertaining the correction factor for the error above mentioned .

While graphs and diagrams are valuable for estimating proportions in which two oils should be mixed, it is suggested that actual determinations should be made when viscosity is important; especially when the blend is to be sold on a viscosity specification. When the necessary instruments are not available the work may be referred to a commercial laboratory.

HEATING VALUE OF HYDROCARBONS IN NATURAL GAS

What is the heating value of propane and butane as found in natural gas? If you have a complete list of the other compounds present in natural gas together with their heating value the same information would be appreciated.—W. T. R.

An excellent paper on the Chemical Composition of Natural Gas, by Garner and Miller, was published in The Oil and Gas Journal, June 16, 1927, page 137, from which the following is taken:

Hydrocarbon—	Heating Value B. t. u. per cu. ft.
Methane	1,009
Ethane	1,764
Propane	2,519
Butane	3,274
Pentane	4,029
Hexane	4,784
Heptane	5,540
Octane	6,295

The heating value of normal natural gas is about 1,000 B. t. u. per foot.

The hydrocarbons found in natural gas are those listed above. The first four are gaseous under ordinary conditions. The last four are normally liquid at atmospheric temperature and pressure, and are the main components of natural gasoline. Methane is the predominating constituent of natural gas and octane is the hydrocarbon present to the least extent.

HYPOCHLORITE TREATED KEROSENE GOES OFF COLOR

We treated some 44/46 kerosene with lime hypochlorite which came out fine, plus 25 color and doctor sweet, but on standing a week the color went down to zero. What is the explanation for this change of color and can you give any suggestion whereby this could be remedied?—R. L. W.

The action of the hypochlorites on petroleum products was investigated by A. E. Dunstan and others. This work was described in the Journal of the Institution of Petroleum Technologists, page 201, 1924. According to Dunstan the satisfactory application of hypochlorite depends very much upon the quantity of free alkali present in the solution and this factor should be kept within narrow limits. It is concluded that the hypochlorite acts as an oxidizing agent, converting the sulphur compounds into substances quite soluble in water and alkali; therefore, easily removed. The mercaptans are changed into sulphonic acids; these are easily soluble in water and caustic soda solutions.

The facts appear to apply to the lighter petroleum fractions, and especially the lightest gasolines, but with the heavier fractions it is observed that the heavier bodies of unknown chemical structure are only partially converted into soluble compounds. The high boiling, or heavier substances, present in the kerosene fraction are not completely acted upon and consequently there cannot be complete removal of the color producing bodies.

It is well known that chlorin, the active bleaching agent in the hypochlorite solution, under many conditions does not produce stable compounds. There may have been a partial change in this special instance but the fleeting stability was evidenced by the rapid reduction in color value. It would appear that the better practice would be to treat with acid and follow with the regular sweetening operation. However, with a product 44/46 gravity it should not be necessary, unless there is some local composition condition, to do more than apply the sweetening process including alkali and doctor.

DIESEL ENGINE FOR AIRPLANE MOTORS

I have seen a press report stating that the Diesel engine had been developed which operated on the gas made from heavy oil. If you have any details about this, the information would be appreciated.—L. R. P.

There was a recent statement by Henry Ford that he was working on a Diesel engine for airplane motors with which it was their hope to produce 10,000 horsepower. This engine, while not perfected, is being designed to weigh one pound per horse-power developed.

Considerable progress appears to have been made in processes for the conversion of heavy oils into gas which is used as the fuel. The trouble experienced in gasifying heavy fuel oil has been the great quantity of carbon deposited which not only lowers the rate of heat transfer but also requires frequent shut downs for the removal of the coke and carbon.

In the Hakol-Zwicky process, as described in a recent number of the Fuel Economist, the carbon problem is reported to have been solved. It is claimed for this process that it works efficiently on the heavy fuel oils with the formation of a clean and stable gas which may be used for all industrial purposes. The filtered oil is passed through a preheating coil in a hot water chamber where it becomes heated up to about 160 degrees Fahrenheit to 190 degrees Fahrenheit, and is then injected, with a regulated quantity of air, into a horizontal cylindrical combustion or gasifying chamber lined with fire brick. In this chamber a part of the oil undergoes a partial combustion, and the whole is converted into gas or light vapor. Low air pressure is used, and the air can be supplied either from a compressor or by a small fan and motor. An important feature of the apparatus, which is responsible for the avoidance of solid carbon formation, is the injection of the oil and air along the central axis of the chamber and the introduction of secondary air at the opposite end of it which serves as a cushion against which the advancing column of flame strikes and is turned back along the chamber walls, but without actually touching them. This appears to be an essential condition for the prevention of solid carbon, and it can be attained with perfect regularity due to the construction of the burners and chamber.

The combustion of a part of the oil produces the heat to crack and gasify the remainder of the oil. The gaseous mixture passing out of the chamber consists of hydrogen, methane, carbon monoxide and some unsaturated hydrocarbons, as well as carbon dioxide and nitrogen. Some finely divided carbon and tar particles are also present in the form of a tar mist, but if the gas is to be used direct from the generator, these are not detrimental. But if a clean gas is desired, the gas is filtered through a duplex asbestos filter to remove the carbon particles and then passed through a Smith's tar extractor under slight pressure. The gas then receives a water wash which removes the small quantity of condensable hydrocarbons.

The following details of a test are given: The oil used was 28 A.P.I. gravity; the total oil consumed was 225 pounds; the average consumption of oil while gassing was 3.83 gallons per hour; the average volume of gas per hour was 3.035 cubic feet; the average value of clean gas was 177 B.t.u. per cubic foot; cooling water used, 355 gallons per hour; total heat in oil gasified, 652,500 B.t.u. per hour; total heat in gas, 537,195 B.t.u. per hour; sensible heat in cooling water, 106,500 B.t.u. per hour; heat efficiency of clean gas, 82.3 per cent; and heat efficiency overall in hot gas, 98.6 per cent.

The analysis of a sample of clean gas showed the following percentage composition: Carbon monoxide, 17; hydrogen, 9.26; methane, 5; unsaturated hydrocarbons, 2.75; carbon dioxide, 3.85; and nitrogen, 62.14.

REFILLING AIR CHAMBER ON HIGH-PRESSURE PUMP

A pipe line pump working under a pressure from 700 to 800 pounds with an air chamber, which in time becomes flooded, and to refill this chamber it is proposed to drain, close the valve, and introduce air at 200 pounds pressure. Then the valve is to be cracked and the question is, would oil under 700 to 800 pounds pressure spray into the air chamber and produce a dangerous condition?—H. V. M.

It appears that there would be no danger in the practice outlined for the following reasons: The volume of air under 200 pounds pressure would have to be compressed less than four times and the resultant heat would not be sufficient to ignite the oil. Furthermore, the compression caused by the influx of the oil through a cracked valve would be so gradual that the heat of compression would in all probability be dissipated in and through the walls of the air chamber as rapidly as generated.

There would be little chance of ignition unless the oil came in contact with the air in a very finely divided state and this condition could exist only immediately following the opening of the valve, as the oil would very quickly cover the valve opening and stop any spraying action. Therefore, the spraying action would occur only at the very beginning of the filling when no heat had been generated. It would be well to see that the air under 200 pounds pressure is cooled before admitting it to the air chamber, so as to keep the temperature down to a minimum.

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SMITHSTEEL
CRACKING STILLS

Determining Volatility of Gasoline

New Device Known as Black-Surface Indicator Suggested as Practical Method for Testing. Apparatus Described

By Reston Stevenson and Joseph A. Babor[1]
The College of the City of New York, New York, N. Y.

Since the use of gasoline as a fuel in internal combustion engines requires its preliminary vaporization to some extent, the measurement of its volatility has always been considered important. Until recently the only method for determining this volatility has been the Engler distillation or, as it is now called, the A.S.T.M. distillation.

It has long been recognized that this is an unsatisfactory method, for a number of reasons, particularly because fractionation is not the procedure of the vaporization that actually occurs in good practice in an automobile. Fractionation is the process of separation, whereas in the preparation in the automobile manifold of a gas mixture for combustion in the cylinders one seeks to integrate the vapors and have them so uniformly mixed that the gas mixture is one phase. This is the procedure of equilibrium vaporization, which consists in such a co-ordination of thorough mixing with heating that at each stage throughout the process the liquid droplets are in substantial equilibrium with their entire environment until completely vaporized. This method of equilibrium vaporization not only offers complete or partial vaporization at the minimum temperature, but it is also the means whereby the exceedingly rapid vaporization required for automobile operation is attained. The velocity of vaporization is not a linear function of the temperature but is directly proportional to the velocity of mixing.

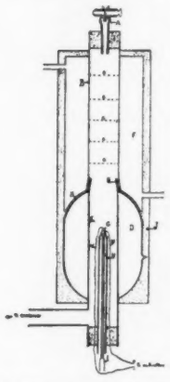

Figure 1—Apparatus for determining equilibrium endpoint of gasoline.

It is unnecessary here to insist further upon equilibrium vaporization, since the general trend in automotive practice is now towards its use. It is mentioned to show the need for a method of measurement of volatility which will correspond to equilibrium conditions instead of the present method of fractional distillation.

Wilson and Barnard[2] applied to gasoline Rosanoff's method of producing an equilibrium solution—that is, a solution in equilibrium with the vapors of completely vaporized gasoline. They determined the vapor pressure of this equilibrium solution of gasoline, thus obtaining the temperatures of complete vaporization at different partial pressures. However, these values were far from correct and they have abandoned this method. In subsequent work Wilson and others[3] have used the temperature at which the equilibrium solution is produced as indicative of the relative volatility of gasoline liquid itself. This method requires a large sample of gasoline, takes several hours to carry out, and precision is not readily obtained.

Deppe Endpoint

Stevenson and Stark[4] made a study of equilibrium vaporization and they developed their phase-change method for determining the temperature of complete vaporization of gasoline at 760 mm partial pressure under equilibrium conditions. This equilibrium endpoint was called the Deppe endpoint and was proposed as a substitute for the Engler distillation. The method is precise and the point is one of perfect equilibrium. It is, however, difficult and requires too much time for rapid industrial use. Therefore the present investigation was carried out to discover a more practical way to determine this point.

The Deppe endpoint applied only to gasoline at 760 mm. partial pressure. The same phase-change method for determining equilibrium endpoints was applied with more labor and less precision to partial pressures less than atmospheric corresponding to the range of air-gasoline mixtures used in automobile operation. The present new and practical method of determining the equilibrium endpoint at 760 mm. partial pressure has been modified to apply to air-fuel mixtures.

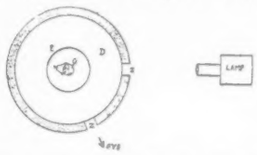

Figure 2—Slits in lagging of dewar bulb.

Gruse[5] made air-gasoline mixtures and determined with reasonable accuracy the dew points by means of the familiar method of the internally cooled mirror. The authors, however, do not consider countercurrent evaporation as a proper means of securing equilibrium conditions.

Others[4,6] have determined the dew points of definite air-gasoline mixtures in closed flasks. However, in closed flasks the temperature is liable to be low because of the decrease in concentration of the gasoline vapors on account of absorption on the walls of the flask and on account of the condensation necessary at the time of measurement. (Table 1.)

All these methods refer to the determination of complete vaporization. Sligh[7] has devised a method for determining partial volatility. It is not the purpose of this article to expound the reasons for the advantages of employing complete rather than partial vaporization in the manifold of an automobile. The writers do claim, however, that even when the automobile is designed to employ partial vaporization under equilibrium conditions, the determination of total volatility is a better indication of the value of a fuel for this automobile's operation than is the determination of partial volatility. This is so because a knowledge of the volatility of the residue of liquid is important since this residue is sometimes vaporized in the manifold, it is sometimes vaporized in the cylinder before combustion, and it should always be vaporized before the end of combustion.

Sligh Method

Sligh[7] and Brown[8] employ the method of partial vaporization of gasoline under equilibrium conditions, with the subsequent separation of the vapor and the measurement of the volume of the liquid residue. Since the liquid gasoline is metered, the volumetric fraction of vaporization at a given temperature is at once calculated. This method does not readily permit the direct determination of the temperature corresponding to any given partial vaporization which may have been stipulated as the optimum degree of vaporization for automobile practice. This temperature is obtained by repeated trial, each time changing the temperature of the bath. Furthermore, this method is never precise because of the errors of such a large area of drainage combined with the measurement of small volumes in a graduate, and this inaccuracy increases with the extent of vaporization. It is not at all adapted to the direct measurement of the total volatility, since that point is obtained only by extrapolation of an unknown curve.

The apparatus and method of Sligh give a temperature of vaporization higher than the minimum temperature obtained under perfect equilibrium conditions. In fact, the writers have constructed a Sligh apparatus and have proved that fuel-air mixtures above the temperatures at which they show complete vaporization under perfect equilibrium conditions in their own apparatus still give a liquid residue according to Sligh's method of measurement in the Sligh apparatus. The temperatures corresponding to perfect equilibrium are the minimum temperatures at each stage of the vaporization. The method of Sligh gives temperatures which are too high; for example, a 15:1 air-fuel mixture of gasoline "E," which showed a dew point of 60.5 degrees Centigrade by the writers' method, was vaporized only to the extent of 98 per cent at 60.5 degrees Centigrade in the Sligh apparatus. The minimum temperature of complete

(Continued on Page 163)

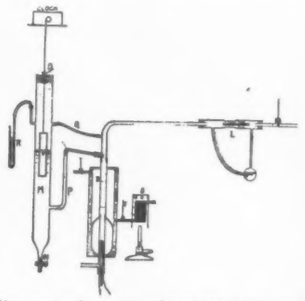

Figure 3—Apparatus for determination of dew points of air-gasoline mixtures.

IMPORTANCE OF DEW POINT

The dew point is the best indication of the temperature of complete vaporization, under equilibrium conditions, of gasoline alone or mixed with air. This dew point may be determined easily, rapidly, and reliably by means of an optical effect shown by a new device called the "black-surface dew indicator."

The disadvantage of actually determining the dew points of the different air-fuel mixtures may be avoided by the use of a graph showing the relation between the dew point alone at 760 mm. pressure and the dew points of the different air-gasoline mixtures. This equilibrium end point or dew point of gasoline alone is especially easy to determine with the black-surface dew indicator, and its relation to the dew points of the air-gasoline mixtures is sufficiently definite for their derivation by means of a graph with practical accuracy. In this way, one simple determination of the dew point of gasoline alone suffices for the deduction of the temperatures of complete vaporization of all the practical air-gasoline mixtures.

TABLE 4—Air Flowmeter Setting for Fuel "A"

Air Temperature at Intake Degrees C.	Barometric Pressure Mm. Hg.	Manometer Pressure Mm. Hg.	Total Actual Pressure in System Mm. Hg.	Volume Liquid Gasoline Fed C.c./Min.	Sp. Gr. of Gasoline	Weight Gasoline Fed Grams/Min.	Weight Ratio Air: Gasoline Desired	Air Desired Grams/min.	Wt. 1 Liter Dry Air Under Actual Conditions Grams	Air Desired Under Actual Conditions Liters/min.
22	754.6	1.5	756.1	2.291	0.732	1.677	15:1	25.16	1.1904	21.15
22	753.8	0.4	754.2	2.291	0.732	1.677	6:1	10.06	1.1873	8.47

TABLE VI—Dew Points Air-Gasoline Mixtures
(Dew points in degrees Centigrade)

Air-Gasoline Mixture Ratio Gasoline	1:1	2:1	3:1	4:1	5:1	6:1	9:1	12:1	15:1	18:1	21:1	24:1	27:1	30:1
						EXPERIMENTAL VALUES								
"A"	107.2	90.0	78.3	72.8	68.9	65.6	59.4	53.9	48.3	46.7	45.0	44.4	42.2	40.6
"B"	105 6	91.1	83.3	78.3	72.8	69.4	63.3	58.3	54.4	51.7	49.4	47.8	46.1	45.0
"C"	108.9	95.6	85.6	78.9	73.3	69.4	62.2	58.3	55.0	50.0	49.4	47.8	46.7	45.0
"D"	106.7	93.3	85.6	78.9	73.3	70.6	61.1	58.3	55.0	51.7	49.4	47.8	46.1	45.0
"E"	123.9	100.6	91.7	86.7	81.1	76.7	69.4	65.0	61.1	57.2	56.1	55.0	53.3	52.2
"F"	120.0	105.6	97.2	91.1	84.4	77.2	72.8	68.9	62.8	60.0	58.9	56.1	53.3	51.7
"G"	146.7	128.9	123.3	117.2	112.2	108.3	101.1	94.4	89.4	83.3	81.1	76.7	73.3	70.0
						VALUES FROM FIGURE 5								
"A"	104.4	90.0	81.1	74.4	69.4	65.6	57.8	53.3	50.0	47.2	45.0	43.3	41.7	40.6
"B"	106.7	92.2	83.9	77.8	73.3	69.4	62.2	57.8	53.9	51.7	49.4	47.8	46.1	45.0
"C"	106.7	92.2	83.9	77.8	73.3	69.4	62.2	57.8	53.9	51.7	49.4	47.8	46.1	45.0
"D"	106.7	92.2	83.9	77.8	73.3	69.4	62.2	57.8	53.9	51.7	49.4	47.8	46.1	45.0
"E"	120.0	104.4	95.0	88.3	83.3	78.9	71.1	65.0	60.6	57.8	55.0	52.8	51.1	49.9
"F"	121.1	106.1	97.2	91.1	86.1	81.7	73.3	67.8	63.3	60.0	57.8	55.6	53.9	52.8
"G"	148.3	133.9	124.4	117.8	112.8	108.3	99.4	93.3	88.3	83.9	80.0	76.7	73.3	70.6

[1]Paper presented at Detroit meeting of the American Chemical Society and reprinted from the society's publication, Industrial and Engineering Chemistry.
[2]This Journal, 13, 906 (1921).
[3]J. Soc. Automotive Eng., 12, 287 (1923).
[4]This Journal, 17, 679 (1925).
[5]Ibid., 15, 796 (1923).
[6]Kennedy, Bur. Standards, Sci. Paper 500.
[7]J. Soc. Automotive Eng., 18, 151 (1926).
[8]Group Session, Motor Fuels, Society of Automotive Engineers, December 8, 1926.

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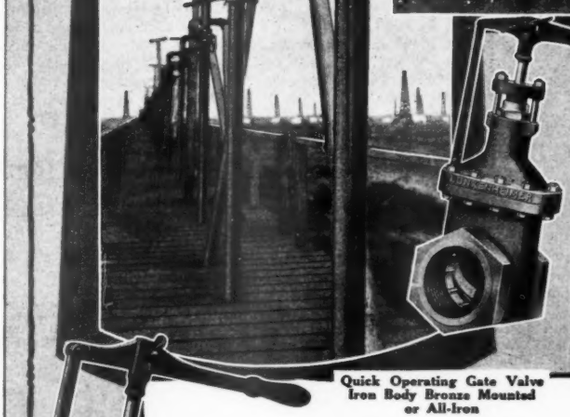

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Of Interest to Sales Departments

Automobiles Not Ready for Advance In Sulphur Content

One of the mooted questions in both the marketing and refining branches of the oil industry is the quantity of sulphur permissible in motor fuels. The present maximum limit is 0.10 per cent as prescribed by government specifications. Many have contended recently that this could limit to 0.20 or 0.30 per cent without injury to the mechanism to the engines of motor vehicles. Raising the sulphur content in many cases would result in a large saving to the refining industry through reduction in treating costs.

These statements during the past year have resulted in several investigations being conducted in both the oil and automobile industries. The Research Laboratories of the General Motors Corp. has conducted an investigation and at the Detroit meeting of the American Chemical Society, H. C. Mougey made a report covering the findings.

Four-Cylinder Engines

The report as summarized in the current issue of the Industrial and Engineering Chemistry, official publication of the American Chemical Society follows:

"Four-cylinder engines appear to be less subject to these corrosion troubles than those with six or eight cylinders, because of their greater breather action. However, there are many records of bad corrosion trouble with four-cylinder engines even when operated on fuels with less than 0.10 per cent of sulphur under conditions favorable to corrosion.

"These devices for combating corrosion are too new to be incorporated in all makes of motors and in some of the lower price automobile they may be considered as desirable accessories rather than as devices which should be furnished by the manufacturer on all models.

"The data indicate that the problem of sulphur in motor fuel from the standpoint of the automobile industry may be summed up as follows:

"1. It has been estimated that increasing the sulphur in motor fuel from 0.10 per cent to 0.30 per cent might result in a saving of $50,000,000 per year in refining costs.

"2. A large portion of the automobiles in the hands of the public would suffer very badly from corrosion if operated in winter in intermittent service on fuel with over 0.10 per cent of sulphur.

"3. Thermostats without crankcase ventilators will not entirely eliminate water from crankcases, and will not protect engines from corrosion if operated in winter, in intermittent service, on fuel with approximately 0.25 per cent of sulphur.

"4. With both thermostats and ventilators, and preferably with oil filters in addition, cars may be operated in all seasons of the year on almost all kinds of service with fuels carrying up to 0.25 per cent of sulphur, with very little trouble from corrosion.

"5. On engines operating continuous-

(Continued on Page 168)

DEPRECIATION RATES

WASHINGTON, D. C., Jan. 14.—Depreciation of 7½ per cent on oil refining plant and equipment, 10 per cent for oil station properties, and 33⅓ per cent for automobile trucks have been approved by the Board of Tax Appeals in the case of the Freedom Oil Works Co. against the Commissioner of Internal Revenue. The Freedom Oil Works Co. has a plant at Freedom, Pa., and branch stations in Pennsylvania, Ohio and West Virginia.

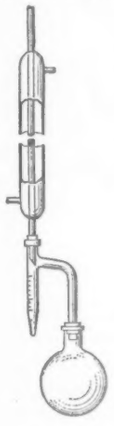
Short Talks on Specifications

By W. T. Ziegenhain

WATER IN PETROLEUM PRODUCTS BY DISTILLATION

Some times water is present in refined oils as a suspension and it is desirable to know the amount of water in the oil. This information is useful in the case of judging fuel oils showing a high b.s. and water test by the centrifuge method. If the oil burners are able to handle a high percentage of carbon in the fuel oil, as many of them are, a high b.s. fuel oil might be acceptable providing the water content is not excessive. A rough idea may be gained from the b.s. and water centrifuge test but a more accurate and dependable test is the water distillation test.

This test may also be used on other petroleum products where the water content is a factor in its usefulness such as in the case of water in gas oil to be charged to cracking units, etc. This test is particularly useful as a control test at any time where the oil is to be heated to a temperature above 212 degrees Fahrenheit, the boiling point of water, for if the water content is excessive there is great chance of an explosion. The water, on entering the hot still or other equipment may vaporize so quickly the pressure rises faster than safety exhaust valves, etc., can act.



To determine the amount of water in a sample of oil the sample is heated under prescribed conditions, sufficient to vaporize all of the water which in turn is condensed and collected in a separate container. The equipment may vary depending upon the kind of oil to be tested. An iron still is used when testing heavy residual products such as heavy road oils, but for ordinary use, a glass apparatus is used, of the type shown here.

It includes a 500 c.c. glass distilling flash, a water separatory tube and condenser tightly connected as shown. One hundred c.c. of the sample are poured in the distilling flask and an equal amount of water-free gasoline. The gasoline acts as a solvent and must pass the following specifications: Five per cent shall distill between 194 and 212 degrees Fahrenheit, and 90 per cent shall distill below 410 degrees Fahrenheit, the tests to be made in accordance with the A.S.T.M. standard distillation test for gasoline.

The purpose of the solvent is to help carry the water vapors over continuously and eliminates foaming. After the sample is thus distilled it is heated by a Bunsen burner or other suitable heating equipment and the rate of heating maintained after the distillation starts, so as to keep from 2 to 5 drops of the distillate falling from the end of the condenser tube per minute. This is continued until all of the water is distilled over as shown by the absence of any water or water vapor in the distilling apparatus. The condensed water and gasoline are collected in the special measuring tube and the percentage of the water in the original sample can be easily calculated from the amount of water collected. This test has been adopted by the A.S.T.M. as a standard and bears the serial designation D 29-27.

BULK STATION IN VIRGINIA

The Colonial Oil Co., a marketing subsidiary of the Tide Water Oil Co., will erect a bulk station on the Elizabeth River in Virginia to serve as a distributing center in that territory. The company has purchased an 8-acre tract and will erect tanks with a total storage capacity of 500,000 gallons. The Texas Company, Sinclair Refining Co., Mexican Petroleum Corp., and the National Oil Co. already have bulk stations near the Colonial location.

EXPORTS OF MOTORS INCREASE 21 PER CENT

One of the developments pointing to a constantly increasing consumption of gasoline and lubricating oils in foreign countries is the increased number of cars made in the United States which are being sold to foreign buyers. The latest report of the Bureau of Domestic and Foreign Commerce is that export sales the first 11 months of 1927 totaled $406,000,000.

This total exceeds the first 11 months of 1926 by 21 per cent. The 1926 sales exceeded those of any previous year. It is pointed out that the increase in exports materialized this year despite the fact that the Ford Motor Co. was inactive the last part of the year. In the past five years the annual value of automobile exports has increased from $222,000,000 in 1923 to the $406,000,000 in 1927.

Forecasters in the industry are anticipating a large increase in sales in 1928 over 1926 or 1927 in the domestic field, and indications are that export volume in 1928 will show at least as great a percentage of further increase as is reflected in the domestic market.

CLOSED CARS POINT TO INCREASE IN GASOLINE AND OIL CONSUMPTION

Eighty per cent of cars manufactured in 1927 were closed models, according to the preliminary report of the National Automobile Chamber of Commerce. The refining and marketing branches of the oil industry have been particularly interested in the trend of recent years toward closed models for the reason that this type of car is used both winter and summer. This general use throughout the year tends to equalize the winter and summer consumption of gasoline and thus add to the total consumption per car.

The production of cars and trucks in 1927 was approximately 1,000,000 under the record year of 1926. This decrease was largely due to the curtailment of the output of the Ford Motor Co. The percentage of closed cars was greater than during any previous year.

Another feature of the 1927 activities of the automobile was the increase in the number of buses. A total of 11,500 buses were manufactured during the year, making a total of 90,000 in use at the end of the year. Buses are the largest users of gasoline and lubricating oils. The report shows a large increase in the number of buses used by street railways and steam railroads to supplement their main service.

The report estimates that 9,697,000,000 gallons of gasoline and 390,000,000 gallons of lubricating oils were consumed by motor vehicles during 1927. These estimates are under those made in the oil industry based on the first 11 months' reports of the Bureau of Mines.

The preliminary report as compiled by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, covering all phases of the automobile industry and allied industries, and published in Automotive Industries, contains additional data which will be of interest to those engaged in the marketing of petroleum products. The summarized report follows:

Production

Cars and trucks	3,530,000
Cars	3,066,000
Trucks	464,000
Production of closed cars	2,452,000
Per cent closed cars	80%
Wholesale value of cars	$2,190,000,000
Wholesale value of trucks	$366,750,000
Wholesale value cars and trucks	2,556,750,000
Tire production	66,000,000
Wholesale value of motor vehicle tires for replacement	$595,000,000
Wholesale valu of parts and accessories for replacements, also service equipment	$750,000,000
Average retail price of cars	$953
Average retail price of trucks	$1,053
Number of persons employed in motor vehicle and allied lines	3,675,000
Taxes on motor vehicles	$725,555,812

Registration

Motor vehicles registered in the United States	23,125,000
Motor cars (state reports)	20,140,000
Motor trucks (state reports)	2,985,000
World registration of motor vehicles	28,900,000
Per cent of world registration owned by United States	80%
Motor vehicle registration on farms	4,700,000
Miles of surfaced highway	575,000
Total miles of highway in U. S.	2,066,081

Retail Financing

Per cent new cars sold on time	58%
Per cent new trucks sold on time	55%
New cars average note at time of purchase	$574
Used cars average note at time of purchase	$286
New trucks average note at time of purchase	$840

Aptomobile's Relation to Other Business

Number of carloads of automotive freight shipped over railroads in 1927	3,125,000
Of rubber imported automobile industry uses	84%
Plate glass used by automobile industry	50%
Copper used by automobile industry	12%
Iron and steel used by automobile industry	14%
Gasoline consumed by motor vehicles, 1927 (gallons)	9,697,000,000
Motor oil consumption (gallons)	390,000,000
Crude rubber used in tires, 1927 (pounds)	630,000,000
Cotton fabric used in tires, 1927 (pounds)	219,000,000

Motor Bus and Motor Truck

Buses in use	90,000
Motor buses produced	11,500
Consolidated schools using motor transportation	14,400
Street railways using motor buses	270
Buses used by street railways	8,600
Buses used by steam railroads	1,175
Steam railroads using motor buses	60
Railroads using gasoline rail motor coaches on short lines	198
Railroads using motor trucks as part of shipping service	58

Exports

Number of motor vehicles exported (U. S. and Canada)	543,000
Value of motor vehicles, parts and tires exported (U. S. and Canada)	$507,500,000
Per cent increase in motor vehicles exports over 1926	12%
Per cent of motor vehicles exported	15%
Number of motor vehicles imported	660

Motor Vehicle Retail Business in United States

Total car and truck dealers	52,592
Public garages	52,086
Service stations and repair shops	85,985
Supply stores	67,753

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The Pipe speaks up:

Hey! TRIMO, that grip of yours is as strong as ever. Don't you TRIMO tools ever wear out? I took an awful beating from a TRIMO Pipe Cutter this morning and now you grab me with a set of jaws that would make any pipe give up. How do you TRIMOS keep young?

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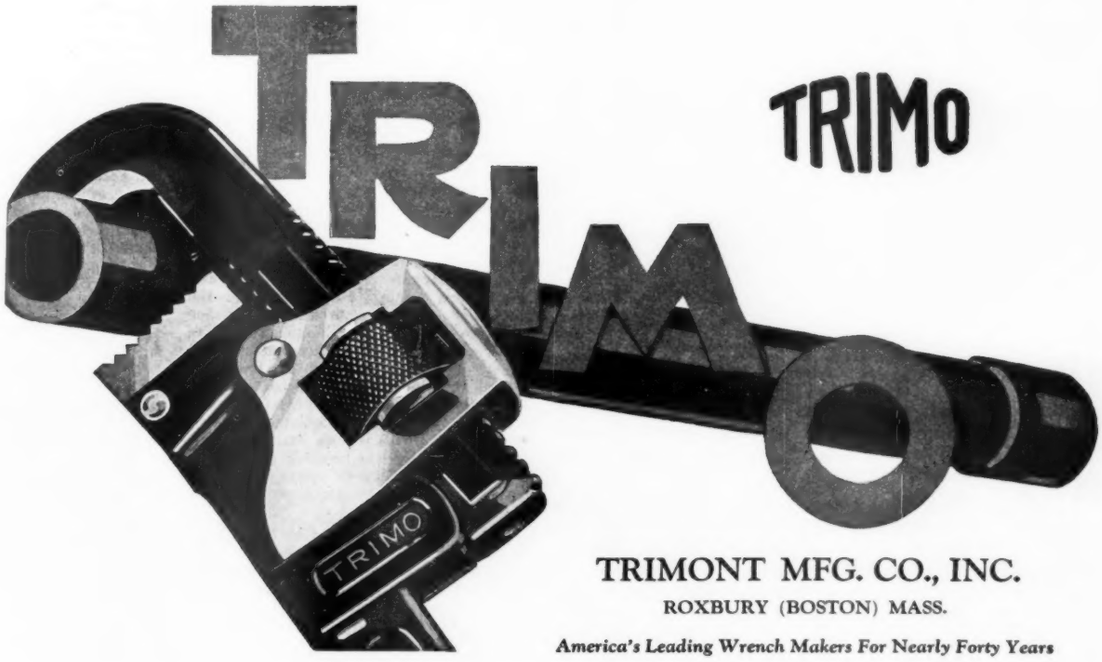
You've sure got the dope on us, sonny, when you say TRIMOS don't ever seem to wear out. I'm surprised that you don't know the reason. It's quality steel and replaceable parts that give a TRIMO tool the edge on any pipe. Just wait until a TRIMO Chain Wrench grips you some day!

The Worker's comment:

My hat is off to the men who make these TRIMO tools. Just about the time any other wrench or cutter would be ready for junk heap, you can slip a replaceable part in a TRIMO, and you've got a new tool. You can't tell me that TRIMOS aren't cheapest in the end!



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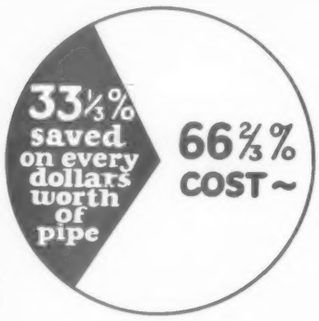

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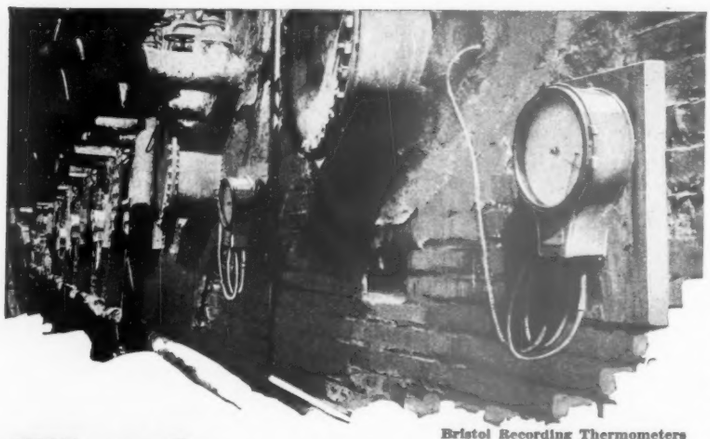

Bristol Recording Thermometers at the plant of the Bolene Refining Co., Enid, Okla.

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The Bristol Company *Waterbury, Connecticut*

PRESIDENT DAWES OF PURE OIL CO. CONFIDENT OF INDUSTRY'S FUTURE

By Henry M. Dawes*
President, Pure Oil Co.

It is not unnatural that the public should be somewhat bewildered in its thoughts about the oil industry. It has come to realize the important part which it has in everyday life since the development and use of automobiles is entirely dependent upon the use of petroleum products.

Everyone is conscious of the fact that our whole social structure, the movement of population, social customs and business progress has been materially affected by the development of this new form of transportation.

In capital invested and volume of business, the petroleum industry is second only to agriculture. The public, therefore, was shocked to be told on apparently good authority a few years ago that the visible available supply of this raw material which turned the wheels of every automobile, to say nothing of the uses of industry, was only sufficient to provide for a very few years' consumption. Coupled with this was the implication that the industry was being conducted in an extravagant, wasteful and unscientific manner. The national defense was stressed and the picture was drawn of a helpless nation without fuel to drive its ships.

Sharply in contrast with this comes the statement that, notwithstanding the constant increase in consumption of these products, the supply of this raw material has increased so rapidly that the very existence of the industry is threatened, because there is so much oil that it has no value.

While perhaps no one has indulged in quite as extravagant statements as these, I believe that the public reaction which has followed many expressions that have been made has been at times hysterical

Difficult Problems

Those charged with the responsibility of producing petroleum's products have in recent years been faced with difficult problems. There is nothing static about the oil business except the necessity for securing the raw material. In spite of criticism that has been leveled at it I am convinced that, paradoxical as it may sound, it is because the oil industry has progressed too rapidly in its attempt to meet public requirements that the present doubt and unsettlement exists in the public mind.

Constructive action under governmental authority has resulted in a survey of the situation which has demonstrated that the progress of the industry along scientific lines in the development of actual and potential crude supply and the economical handling thereof has been a great triumph. Geology, chemistry and mechanical science have multiplied the units of efficiency produced, whether measured in dollars or horsepower. Unless one is to assume a statesmanship and grasp of economics which is almost inspired it is not to be expected that all these new developments of science and enterprise should be immediately digested and assimilated into an industrial organism which would function as smoothly as industries whose position was the result of a gradual evolutionary development.

In a word, we seem to be in a phase in the oil industry where we are suffering from no lack of resources or of ability to progress but too much of these desirable qualities too suddenly maturing. It is in a position more or less analagous to that of agriculture after a few years of bumper crops and low prices. Naturally in a situation of this sort there is a feeling of intense unsettlement, responsible for suggestions of calling in the Government to quiet the troubled waters in very much the same spirit that a traveler falls on his knees in prayer at the first severe squall which he encounters on an ocean voyage. God and the Government can always help, but the Government, like the Almighty helps best those who help themselves.

Progress in Co-operation

Developments in the past year have shown the most unusual progress in the ability of oil men to co-ordinate their activities and operations in a helpful way and to do so without running counter to the essential competitive policies to which our Government is committed. It has been a trying year, but I believe the perspective of time will show it has been an exceedingly constructive year.

It would be futile to attempt to forecast just how long it will be before more stable conditions are assured. No industry known whose basic supply of raw material is adequate and which is dealing in a universally necessary product can flounder very long, and it seems to be that it is logical, and not false optimism, to predict that in the long view the industry will have a history of increasing usefulness, efficiency and the reasonable prosperity which must always flow therefrom.

The problem of securing the maximum of cooperative achievement without resort to governmental coercion or monopolistic control is not a simple one and not one that will be solved by the application of a formula. It is one which has been met and reasonably solved by other industries without violation of the American instinct for independence and in my opinion the oil industry can do what others have done and do so with reasonable expedition.

*In New York Herald-Tribune Financial Review.

TEXAS DRILLING RULE TO U. S. SUPREME COURT

AUSTIN, Tex., Jan. 14.—The United States Supreme Court apparently will be asked to decide whether a rule of the Railroad Commission's oil and gas division prohibiting the drilling of an oil test within 150 feet of a producer or 300 feet of a neighboring property line, is constitutional, Paul D. Page, Jr., Assistant Attorney General, said.

Mr. Page began work on arguments against the Oxford Oil Co.'s new motion that the Federal Circuit Court at New Orleans rehear its suit, contesting the rule, against the Atlantic Oil Co. and the commission as codefendants. Damages approximating $8,000,000 were sought and denied by the Federal Court which held, the Attorney General's Department has said, that the oil division is a valid part of the commission and that its orders are legal.

The rehearing plea, Mr. Page added, "almost certainly is preparatory to an appeal to the United States Supreme Court."

BRITISH GOVERNMENT'S ANGLO-PERSIAN SHARE

In the House of Commons, Sir F. Nelson asked the Chancellor of the Exchequer the amount of royalties paid by the Anglo-Persian Oil Co. to the Persian government for 1926, and whether there was any likelihood of a revision of the agreement between the company and the Persian government. In answer, Mr. Churchill said the royalties paid in 1926 amounted to £1,341,963. As to the second part of the question, he understood no question of revision had arisen. Further replying to Sir F. Nelson, Mr. Churchill said that the original cost of the holding of the British government in the Anglo-Persian Oil Co. was £5,200,000, and the value today was approximately £23,600,000. The government was pledged not to interfere in the commercial management of the company.

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Every development or improvement in oil-field production methods brings new needs for Hercules Power. Under the most exacting conditions of modern operations, Hercules meets every demand for reliability and endurance.

Such exceptional performance as makes Hercules Power outstanding is the result of Hercules seasoned engineering experience and precision manufacturing methods. Hercules rugged construction *assures* long-continued operation.

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Hercules Southern Representatives:
Norvell-Wilder Hardware Co., Beaumont, Texas; Fort Worth, Texas; Houston, Texas; Shreveport, La.
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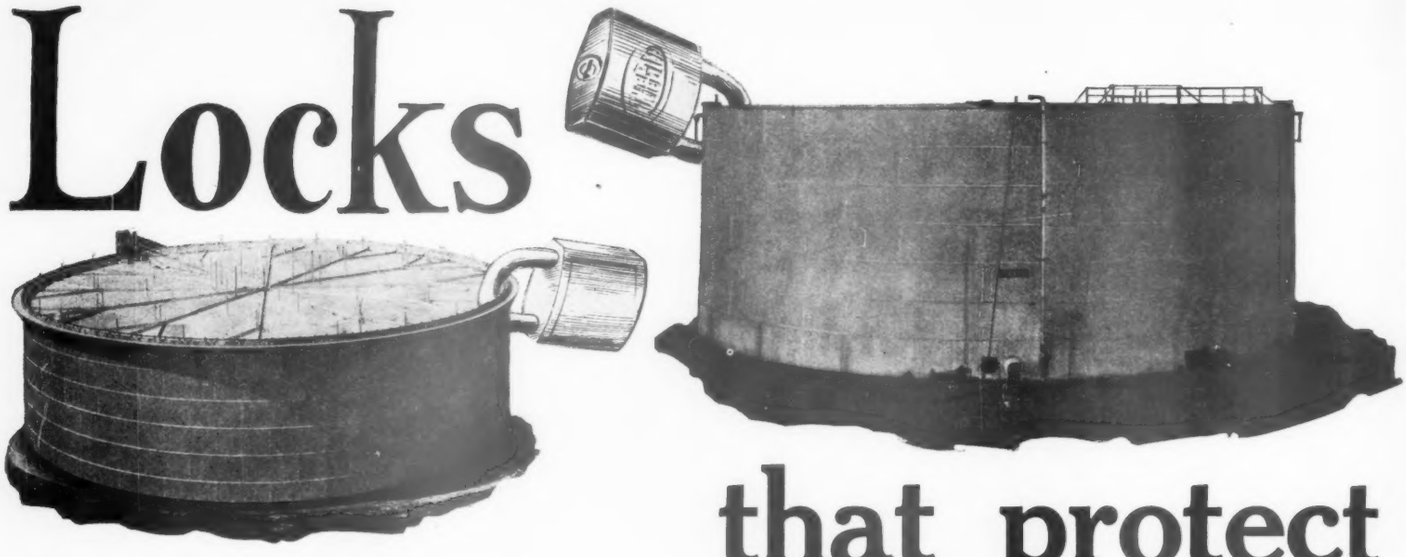
Hercules
ENGINES POWER UNITS

Locks



that protect your most valuable asset

OIL MEN used to lock up their loose change and their old receipted bills while thousands of dollars worth of oil was exposed freely to the ravages of evaporation and fire. But now progressive companies are rapidly adopting Wiggins Roofs.

Oil stored under ordinary "gastight" roofs is not merely in danger of sustaining a loss—it is *certain* to lose its most valuable fractions by evaporation. Wiggins Roofs reduce this loss to the vanishing point.

One type for working storage

Just as different locks are made for different purposes, there are two types of Wiggins Roofs—one to meet the requirements of working storage tanks and one for standing storage. Since in working storage the emptying and filling losses are so great, a floating roof is essential to eliminate these losses as well as ordinary breathing loss. The Wiggins Floating Roof rides up and down with the varying oil level, never permitting any air space under the roof. By a unique principle, exclusive in this design, the space between the floating deck and the tank shell is effectively sealed at all times.

Another type for standing storage

The principal loss in a tank which is filled and emptied only at long intervals is that caused by thermal breathing. The Wiggins Floating Roof will prevent evaporation on such a tank but equally good results can be secured with a smaller investment, by using a Wiggins Breather Roof for this special class of tanks. This roof is attached to the top of the tank shell and moves only by flexing upward and down as the volume of vapor under the roof changes with varying temperature. At the coolest time of the day the roof rests on the roof framing slightly below the tank rim. As the temperature rises the volume of vapor over the oil increases, pushing the roof up and up till at the warmest time of the day it is domed slightly above the horizontal, supported from rim to rim by the vapor. This movement provides more space than is required for ordinary daily thermal breathing. Except while filling and emptying and during big seasonal temperature changes, this roof valve prevents all loss from evaporation.

Fire protection is an added advantage

While evaporation savings pay the cost of a Wiggins Roof in a short time that is not the only reason why oil men are adopting one or the other of these types. The same features of design which check evaporation also serve to prevent fire. This, then, is an added consideration in favor of equipping your tanks with Wiggins Roofs. They are applicable to either new or old tanks. Our nearest office will gladly give you estimating data.

Why not lock up your most valuable asset?

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CHICAGO—2128 Old Colony Bldg. NEW YORK—3147 Hudson Terminal Bldg.
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FLOATING *for working storage*

WIGGINS ROOFS

BREATHER *for standing storage*

O&GJ 1-19 Gray

NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE

Gray County

H. C. McAuley and others' No. 2 J. S. Morse, 330 feet north and west of SE cor. NE, Section 3, Block 26, H. & G. N. Survey.

Hutchinson County

Phillips Petroleum Co.'s No. 1 J. J. Perkins-Hamilton, 330 feet north and east of the SW cor. of the north 240 acres of the south 320 acres of Section 22, Block 47, H. & T. C. Survey.

Potter County

Amarillo Oil Co.'s No. 2 E. Fuqua, C NW, Section 18, Block 6, B. S. & F. Survey.

NORTH CENTRAL AND WEST TEXAS

Archer County

Continental Oil Co. and Perkins & Cullum's No. 7 L. F. Wilson, 490 feet north and 800 feet east of SW cor. SW SE, Section 114, A. T. N. C. L. Survey. H. Hines and others' No. 1 S. G. Helm, 450 feet north and 1,320 feet west of SE cor., Section C, Club Ranch Subdivision. Carey & Rhader's No. 4 W. R. Farmer, 2,648 feet south and 2,742 feet east of NW cor., Section 1, J. Poitevent Survey, A-347. Lee Wilson's No. 4 W. R. Farmer, 2,948 feet south and 3,855 feet east of NW cor., Section 1, J. Poitevent Survey, A-347.

Brown County

J. B. Baker, Jr.'s No. 1 R. A. Broocke, 434 feet south and 4,511 feet east of the most westerly NW cor. of the R. A. Broocke 366-acre tract out of the Jose Padilla Survey No. 645, A-740, being 150 feet north and west of SE cor. of his 100-acre lease. Cranfill & Reynolds' No. 1 T. E. Hill, 1,050 feet north and 3,116 feet east of SW cor. of the Myram Mudgett Survey No. 63, A-648. Gibson Oil Corp.'s No. 1 J. B. Watson, 150 feet south and 700 feet west of NE cor. of the J. B. Watson 213.5-acre tract out of the Patrick Magee Survey No. 649, A-665. Ray Oil Co.'s No. 1 Fannie Allcorn, 2,952 feet south and 1,750 feet west of NE cor. of the Roland Honeycutt Survey No. 623, being 2,952 feet south and 150 feet east of the NW cor. of the Fannie Allcorn 100-acre tract.

Coleman County

Gwinnup & Bradstreet's No. 1 J. P. Morris, 150 feet north and east of the SW cor. of the J. P. Morris 210.1-acre tract out of the R. Cochran Survey No. 269. Miss N. McChesney's No. 1 R. N. Storey, 150 feet north and 2,382 feet east of the SW cor. of the R. N. Storey 304-acre tract out of the Samuel Sprague Survey No. 748.

Culberson County

Deep Rock Oil Co.'s No. 1 J. P. Seay, 150 feet south and east of the NW cor., Section 20, Block 59, Township 7, T. & P. R. R. Survey.

Pecos County

Humble Oil & Refining Co.'s No. 6 M. A. Smith, 1,406 feet south and 2,800 feet west of the NE cor., Section 36, Block 194, G. C. & S. F. Survey. Same company's No. 4 M. A. Smith-B, 1,842 feet north and 3,158 feet east of the SW cor., Section 101, Block 194, G. C. & S. F. Survey. Mid-Kansas Oil & Gas Co.'s No. 10 Smith-Taylor, 250 feet south and 378 feet east of the NW cor., Section 33, Block 194, G. C. & S. F. Survey. Pandem & Gibson Oil Corp.'s No. 6 Pecos River Bed, 1,050 feet north and 433 feet west of the most easterly SE cor., Section 61, Block 1, I. & G. N. Survey, and located 300 feet upstream from well No. 5. The California Co.'s No. 11 Mrs. M. A. Smith, Lease No. 3, 896 feet north and 378 feet west of the SE cor., Section 35, Block 194, G. C. & S. F. Survey. Same company's No. 11 I. G. Yates, Lease 1, 668 feet north and 378 feet east of the SW cor., Section 34, Block 194, G. C. & S. F. Survey. Same company's No. 12 I. G. Yates, Lease No. 1, 250 feet north and 378 feet east of the NW cor., Section 33, Block 194, G. C. & S. F. Survey, and located in Section 34.

Reeves County

Vacuum Oil Co.'s No. 1 Grisham-Hunter, 2,640 feet south and 150 feet west of the NE cor., Section 46, Block 55, School Land.

San Saba County

C. D. Wilmott's No. 1 Mrs. Julia A. Moore, 12,750 feet southeast of the northwest line and 2,500 feet northeast of the southwest line of the Juan Antonio Hernandez Survey No. 78.

Sutton County

National Potash Co.'s No. 1 J. N. Ross, 1,300 feet south and east of the NW cor., Section 6, Block 14, T. W. N. G. R. R. Survey.

Terrell County

Champlin Oil & Refining Co.'s No. 1 Carter, C NW, Section 5, Block 2, C. C. S. D. R. G. N. G. R. R. Co. Survey.

Wichita County

Grayce Oil Co.'s No. 4 O. & F. Schimisseur, 685 feet north and 430 feet east of the SW cor., Section 73, Red River Valley Land. Magnolia Petroleum Co.'s No. 12 F. P. Warren-K. & G., 550 feet north and 1,150 feet west of the SE cor. of the F. P. Warren 320-acre tract out of the William Kepler Survey, A-170. W. J. Moran's No. 15 F. P. Warren, 450 feet north and 850 feet west of the SE cor. of their lease out of the W half of the William Kepler Survey, A-170.

C. H. Lebow's No. 11 A. J. Schultz, 2,050 feet south and 1,550 feet west of the NE cor., Section 4, H. T. & B. Survey, A-474. The Texas Company's No. 338-A W. T. Waggoner, 330 feet south and 1,988 feet east of the NW cor., Section 2, Seale & Morris Survey, A-535, and located in the F. J. Cook Survey, A-553.

Wilbarger County

The Texas Company's No. 345 W. T. Waggoner, 205 feet north and 1,829 feet east of the SW cor., Section 33, Block 4, H. & T. C. Survey.

Winkler County

The Texas Company's No. 5 Grisham-Hunter-B, 330 feet north and 1,650 feet west of the SE cor., Section 34, Block B-5, School Land.

Young County

Ray Anderson and others' No. 1 W. C. Leberman, 150 feet south and 750 feet west of the NE cor., Section 154, T. E. & L. Survey. United Royalties Co. and Jacob Oil & Gas Co.'s No. 1 M. Taylor and others, 200 feet south and west of the NW cor. of the J. R. Jowell Survey, A-1,331, and located in the M. W. Baker Survey, A-52.

Corrected Locations

In Archer County: Lee Wilson's No. 3 W. R. Farmer, 2,948 feet south and 3,580 feet east of the NW cor., Section 1, J. Poitevent Survey, A-347, being 150 feet north and 450 feet east of the SW cor. of his 40-acre lease.

In Brown County: Daniels and others' No. 1 H. L. Allcorn, 2,952 feet south and 2,050 feet west of the NE cor. of the R. Honeycutt Survey No. 623, being 2,952 feet south and 150 feet west of the NE cor. of the H. L. Allcorn 110-acre tract.

In Howard County: Gulf Production Co.'s No. 4 Otis Chalk, 1,523 feet north and 207 feet east of the SW cor. of their lease of 160 acres out of Section 125, Block 29, W. & N. W. R. R. Co. Survey.

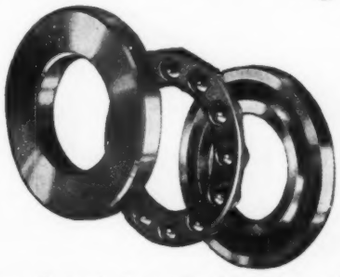
APPARATUS FOR FINDING VOLATILITY OF GASOLINE

(Continued from Page 156)

vaporization is by defnition, the equilibrium temperature.

The new and practical methods for the determination of complete vaporization (total volatility), under perfect equilibrium conditions, of liquid gasoline and

Fine Steel for Fine Bearings



Each bar of steel that goes into the making of Aetna Thrust Ball Bearings is not only ordered to strict specifications, but undergoes a severe metallographic test in the Aetna Engineering Laboratories. Only the finest steel is accepted —for Aetna Bearings must outlast all others.

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This hose is especially made for oil well use, constructed of highest grade materials insuring the greatest flexibility and economy in drilling.

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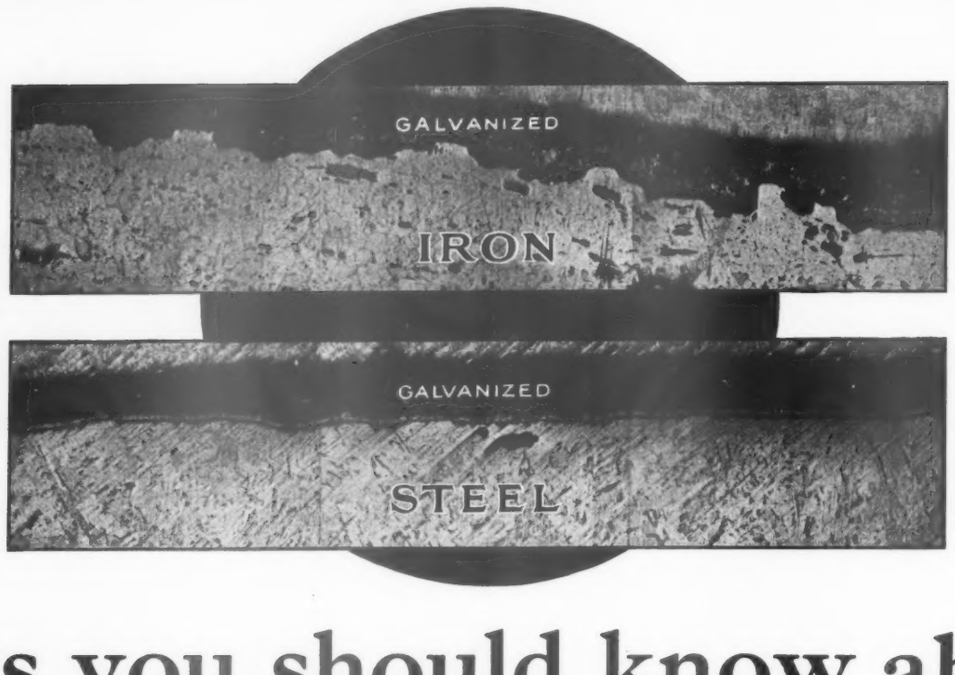
NEW YORK RUBBER CORP.
Established 1851
BEACON, N. Y.
New York Office — 25 West 43rd Street

Note rough surface of wrought iron which soaks up the zinc and holds it in a vise-like grip, so that the coating won't flake or peel off.



Note relatively smooth surface of steel, giving such poor anchorage for zinc that it flakes and peels off in handling and wear.

Facts you should know about Galvanized Tubing

BYERS galvanized tubing as well as other pipe in recent tests has shown remarkably long life where other galvanized pipe has rusted out in a short time. The difference in favor of Byers is so marked (from 10 to 20 times longer life) as to call for explanations.

Zinc is such a brittle material that it has never been successfully used alone where strength and light weight are required. Even when applied on a steel base (as in galvanized pipe) its brittleness is so pronounced that the coating will chip or flake off with cutting, threading, screwing up, etc., and where subject to wear.

Zinc Sticks to Byers

When applied on Byers Pipe, the rough surface of the pipe metal holds the zinc in a vise-like grip which prevents it from peeling off. No metal except genuine wrought iron has this rough surface. So-called "iron pipe," sold under various names, does not have it, being in fact only steel of low carbon analysis made in open hearth furnaces.

Corrosion Test

If you have corrosion trouble anywhere, write us. A corrosion test is easily arranged, and may save you big money in future operations.

Byers galvanized pipe hammered flat, without showing tendency of coating to flake or peel off.

Steel pipe submitted to same test as shown above. Note how galvanizing comes off in big flakes.

Make this easy Test!

Cut off two pieces of galvanized pipe, from one to two inches long, one of them Byers, the other steel. Note how the galvanizing flakes off the steel from the end where cut. Then crush both pieces flat with a hammer, and see what happens to the galvanizing! It peels off the steel in big flakes, but sticks to wrought iron like glue.

A. M. BYERS COMPANY
Established 1864 Pittsburgh, Pa.

DISTRIBUTORS
Jarecki Mfg. Co. Oil Well Supply Co.
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the *Spiral Stripe* protects you against mistakes and substitution
Also look for name and year rolled in metal

GALVANIZED BYERS Tubing
GENUINE WROUGHT IRON

of gasoline in its admixtures with air, will now be described.

Equilibrium Endpoint

Apparatus—The apparatus employed to determine easily, quickly, and accurately the equilibrium endpoint at 760 mm. partial pressure of complete gasoline vapor is shown in Figure 1. It consists of the following parts:

1. A dropping funnel of about 50 cc. capacity. Only the tip, A, where it enters the vaporizer, is shown in the figure.

2. The vaporizer, B, which is a tube of copper 1.2 cm. internal diameter and 20 cm. long, into which are cast five 40-mesh copper screens, C. The hot walls and the hot screens heat the gasoline and its vapor in stages, and at each stage the droplets are caught on the screens where they are directly heated while scrubbed with the gasoline vapors. The screens also homogenize the mixture. It was inferred that this would give practically perfect equilibrium vaporation, and tests indicate that this is true.

3. A Dewar bulb, D, 6.5 cm. outside diameter, 1.9 cm. inside diameter, and 7.6 cm. long, fits tightly into the lower end of B by using a cork stopper. A part of the inner wall, E, near the top is frosted to indicate the presence of any unvaporized gasoline.

4. The vaporizer and, to some extent, the upper part of the Dewar bulb are heated by means of the jacket, F, 6.5 cm. outside diameter and 20 cm. long, which carries a stream of superheated steam or hot air. The heating jacket and the Dewar bulb are heavily lagged, J. The heating of the upper part of the Dewar bulb is accomplished by steel-wool packing, X, between the bulb and the heating jacket.

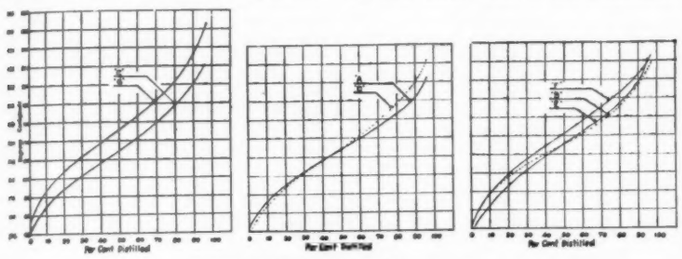

Figure 4—Engler distillation curves.

5. The heater of the steam or air is shown in Figure 3, S. It is of the usual type and is heated by a Bunsen burner. Superheated steam is preferred to hot air. The temperature of this entering stream is indicated on the thermometer, T (Figure 3).

6. The bottom of the Dewar bulb consists of a T-tube, the branch, 1.3 cm. inside diameter, going to the condenser as indicated and the straight end serving for the insertion of the black-surface dew indicator.

7. This black-surface dew indicator is a platinum blowpipe tip, G, carrying an iron and a constantan wire, W, of about 25 B. & S. gauge, soldered into the apex and about 2 mm. from the apex, respectively. These wires go back to a millivoltmeter. The platinum tip is sealed to the top of a soft-glass tube, H, 0.6 cm. inside diameter, by fusion with lead glass. The tip is cooled internally by means of a regulated flow of compressed air through the glass tube I. The platinum tip is covered with a fine, thin, adherent plating of platinum black. It is conveniently cleaned by dipping in benzene. This tip shows at once the presence of any condensed liquid by an obvious optical phenomenon. There are two slits, Z, Figure 2, about 0.6 cm. wide by 5 cm. high in the lagging of the Dewar bulb; through one of these slits comes the illumination such as is used for microscopes and through the other slit the observer notices the optical change. When the tip is very wet it shines very brightly and when less wet it glistens. Even the slightest condensation is immediately obvious by a darkening or smoothness of appearance. The optical effect is not only a surface phenomenon but the condensed liquid also permits the light to reach the bright metal underneath and to be reflected back to the observer's eye.

Operating Procedure

Procedure—The procedure has already been suggested in the description of the apparatus. The illuminator is turned on, the superheater started, and the air or steam passed through it. The thermometer in this stream should register about 230 to 260 degrees Centigrade.

About 30 cc. of the sample of gasoline are put into the dropping funnel and the stopcock is turned on to give a flow such that the drops are not quite separate.

The frosted part of the tube wall of the Dewar bulb and the appearance of the platinum-black tip show whether there is complete vaporization. If this wall is wet, the temperature of the superheated steam must be raised.

The platinum tip is cooled by the compressed air. At the first appearance of condensation the temperature of the tip is noted. It should be 8 to 16 degrees Centigrade lower than the temperature of the uncooled tip. After practice this range of superheat is at once realized without further adjustment.

Having thus obtained complete vaporization of enough gasoline to give an atmosphere of exclusive gasoline vapor maintained at sufficient superheat to insure against any unvaporized residue and against any condensation except on the internally cooled tip, and having determined the approximate temperature of condensation, one now proceeds to get the precise temperature. This is done by cooling the tip rapidly by a large stream of compressed air to the approximate temperature and then cooling slowly until moisture just appears on the tip between the two wires. This is the temperature of condensation. It denotes the temperature of complete vaporization more accurately than a direct determination of the attainment of complete vaporization, even as the accurate determination of a boiling point is always made by determining the condensation point. At the initial condensation point there is complete vaporization, a condition of perfect equilibrium with a uniform vapor phase. The point as measured must be corrected to 760 mm. at the rate of +0.04 degrees Centigrade per mm. below 760 mm.

When the equilibrium endpoint is thus determined for any sample of gasoline, the gasoline remaining in the dropping funnel is removed, 10 cc. of the new sample are added and allowed to run out displacing the vapors of the previous sample, then 30 cc. more of the new sample are added. The feed is not turned off during this change of sample, and after about 3 minutes everything is ready for cooling the tip to get the new condensation temperature. Thus, when 10 samples are to be tested each should not take longer than 10 minutes. The error should not exceed 0.5 degrees Centigrade.

Verification—The direct heating of the liquid on the walls and particularly on the heated screens while maintaining the liquid in intimate contact with its vapors, the scrubbing effect of the moving vapors, and the mixing effect of the spaced screens are conditions which tend to produce equilibrium vaporization so that one phase of vapor is formed at the minimum temperature.

However, while approximating a volatilization under equilibrium condition, it is recognized that the attainment of perfect equilibrium by rapid vaporization is impossible at the precise endpoint temperature. Therefore, the vaporized gaso-

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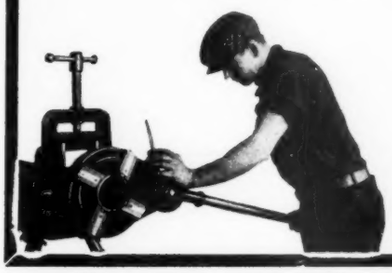
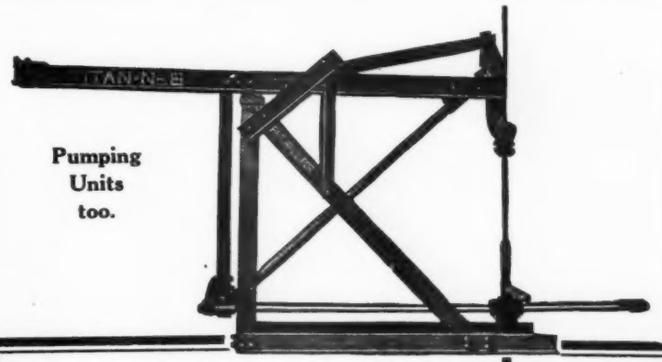


"Toledo" No. 40 Pipe Cutter cuts 2" to 4", easily, quickly, without burr. Net price, $60.00, f.o.b. Toledo, Ohio.



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In "IWANA" Hair Belting you are assured of quality par excellence. "IWANA' Hair Belts are built up to the standard of highest quality and not down to meet a price.

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Style 150 was developed for highest speed centrifugal pumps, 3700 R. P. M., 1200 pounds pressure. Developing terrific speed, all centrifugal pumps on U. S. S. Aeroplane carrier Lexington, largest newest ship in the Navy, are packed with it, handling water, oils, fuel oils, etc. Style 150 has a "CRANEUM" Core (finely divided metal, graphite and suitable binder) all in babbitt foil armor. Easily compressible with gland adjustment. Non-hardening. No shaft cutting. Easy to remove. Use it on gasoline, mineral seal oil, hot and cold water, hot oils, rotary pumps, such as Kinney, Blackmere, Roper, etc.
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John Crane

line is somewhat superheated and is given a little time to establish homogeneity by mutual diffusion and then this monophasal vapor is cooled down to a point where a slight amount of condensation occurs. Even this slight condensation does not at all affect the concentration of the gasoline at the moment the temperature is measured, because the gasoline vapor from which the condensation has occurred is no longer present but has been succeeded by complete gasoline vapor. Therefore, the point of initial condensation in a stream of vapor gives the true temperature, which is slightly higher than that obtained in the closed-flask methods.

Further evidence that the vaporization has proceeded under approximately equilibrium conditions is shown by the remarkable velocity with which the gasoline is evaporated. It is only by the maintenance of approximate equilibrium that the liquid gasoline can be completely vaporized so quickly. The reason for this is not generally appreciated. A liquid droplet at a given temperature immediately forms a coating of vapor around it in equilibrium with the droplet. However, this coat of vapor smothers any further vaporization, and even if the temperature of the droplet increases, it only serves to increase the concentration of the vapor just around the droplet. Temperature alone is an inadequate means of vaporization, since it produces only spheroids or decomposes the gasoline. However, if this coating of vapor is removed, then the droplet immediately forms more vapor in its place. The time required to form vapor from a liquid is practically zero, so that the time required to vaporize a liquid into space is proportional only to the velocity with which the vapor is removed from the droplet into the space. The more rapidly this coating of vapor is removed the greater is the velocity of vaporization, the more nearly are the droplets in equilibrium with their environment the nearer the approximation to perfect equilibrium conditions. The heated screens offer excellent means for the rapid removal of the coating a vapor by the scrubbing of the vapor stream. In the presence of air this scrubbing effect is magnified, because there is acting as a brush not only the vapors but also the air. Therefore, approximate equilibrium conditions maintained by the co-ordination of heating with thorough and rapid mixing, permit the consummation of vaporization in a hundredth of a second in the manifold of an automobile.

Verification of Procedure

The verification of this apparatus has also been demonstrated experimentally. A comparison of the results as determined by the phase-change method[3] and those obtained with this apparatus are given in Table 1.

TABLE 1
Equilibrium Endpoints at 760 mm. Partial Pressure of Gasoline Vapor

Sample of Gasoline	Phase-Change Method °C.	Black-Surface Method °C.
Socony 1925 "A"	150.0	152.3
	143.5	144.7
B. of S. "B"	153.4	154.0
B. of S. "C"	163.3	166.0
Stock 1925	157.9	160.0

These condensation points are in fact boiling points,[3] being the boiling points of the equilibrium solution. Table 2 shows how well this apparatus determines the boiling points of pure compounds.

TABLE 2
Boiling Points and Equilibrium Endpoints of Pure Compounds

Compound	Boiling Point* °C.	Equilibrium Endpoint† °C.
Xylol—EK	140.3	140.3
Alcohol	78.9	79.0
Bromobenzene	156.0	156.8
Chlorobenzene	132.0	132.0

*Determined with a B. of S. thermometer
†Results obtained by using apparatus and method described herein.

Results—The results obtained with this apparatus upon the samples of gasoline employed are given in Table 3.

TABLE 3
Equilibrium Endpoints of Gasolines at 760 mm. Partial Pressure

Gasoline	°C.	Gasoline	°C.
"A"	144.7	"E"	163.4
"B"	154.0	"F"	166.6
"C"	154.0	"G"*	191.9
"D"	154.0		

*Special blend made by mixing 80 per cent Socony gasoline with 20 per cent Socony kerosene.

[3]Young, "Stoichiometry," p. 137 (1908).

The Engler distillation curves for these gasolines are given in Figure 4.

Discussion—Obviously the Engler curve and endpoint do not express the total volatility of a gasoline. The equilibrium endpoint represents by means of a single number this total volatility. The writers contend that the order of relative volatility that exists at 760 mm. partial pressure is the same as at 15 mm. partial pressure (within the range of automobile practice) and that even the quantitative differences are proportionately maintained with approximate accuracy.

Dew Points of Mixtures

Apparatus—The apparatus is shown in Figure 3. The device for vaporizing the gasoline and determining the dew point is the same as already described under Equilibrium Endpoint of Gasoline. The method of metering the air by flowmeter and the gasoline by a clock feed are the same as described by Sligh[3] except for the following modifications:

1. The flowmeter, L, has a manometer tube that is parabolic in order to measure and maintain small as well as large velocities with equal precision.

2. The gasoline container, M, is closed at the bottom with a mercury seal, N, to prevent leakage and contamination with stopcock grease. Another mercury seal, O, at the top prevents a loss of air and avoids the fractionation of the gasoline sample with the loss of its most volatile constituents by countercurrent evaporation. The use of the bent tube, P, insures a true sample of the gasoline taken from within the liquid and not from its surface. The tube, Q, equalizes the pressures and the water manometer, R, measures the total pressure.

Procedure—From the known rate of feed of the liquid gasoline and its specific gravity one calculates the weight of gasoline per minute and from that the weight of air needed for any given mixture (e.g., 15:1). The number of liters of air per minute are then calculated to give, at the measured temperature and at a pressure equal to the barometer plus the manometer R, the calculated weight of air. The air is sent through the flowmeter at this rate and the gasoline is simultaneously fed by the clock and plunger. A stream of hot air heats the vaporizer, B, the black surface indicator is cooled by compressed air, and the dew point is determined in the same way as the condensation point for gasoline vapor alone.

The air-gasoline mixture is burned after it leaves the apparatus.

Table 4 shows the calculations for determining the setting on the flowmeter, L, Figure 3.

Verification—The apparatus was first employed for determining the dew points of chlorobenzene and air and also bromobenzene and air. The liquid feed and the air feed were adjusted to produce mixtures of air and vapor corresponding to the partial pressures of the vapor as given in the tables of Landolt-Bornstein. The dew points were determined as already explained with the black-surface dew indicator. The results are given in Table 5. The temperatures from the Landolt-Bornstein tables are also given for comparison.

TABLE 5
Dew Points of Mixtures of Chlorobenzene and Air and of Bromobenzene and Air

Substance	Vapor Pressure Mm. Hg.	Landolt-Bornstein °C.	Dew Point °C.
Chlorobenzene	26.68	40.0	38.2
	41.46	50.0	49.5
	64.74	60.0	60.6
Bromobenzene	16.92	50.0	50.3
	27.54	60.0	60.6
	43.31	70.0	70.0

Results—The experimental results for air-gasoline mixtures are given in Table 6. These results were plotted and the best curve was drawn for each gasoline, except that the results for gasolines "B," "C," and "D" are so nearly identical that one curve alone sufficed for the three gasolines (Figure 5.) The corrected dew points as read from these curves are also given in Table 6.

There is a close correspondence with the experimental values.

Equilibrium Endpoint

The experimental determination of the dew points of the different air-gasoline mixtures within the range of use in an automobile is difficult and laborious. The

Is Pop one of the 5 per cent?

"Here, Lad—

we've had a big conference on the equipment for the new pipe line and the still piping.

I presented your recommendation showing the big savings obtainable from arc welding the two jobs.

We've just adjourned until this afternoon, so anything is liable to happen now—"

How to KNOW!

A new textbook on Arc Welding (Price $1.50) will be sent on approval for five days to any executive requesting it. Book size, 6"x9"—total pages, 160—number of illustrations, 200—Charts, 62—Divisions, 8.

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nothing is liable to happen.

That's what usually happens in any big conference—and especially one on arc welding.

Who in the conference KNOWS the savings and improvements obtainable from 'Stable-Arc' welding? (If they all knew they'd adopt it).

Who in the conference KNOWS the cost, first and maintenance, of threaded piping? (If they all knew they'd reject it).

But not *knowing*, *the* majority will always be for conservatism.

—that's why 95% of the thinking is done by 5% of the people

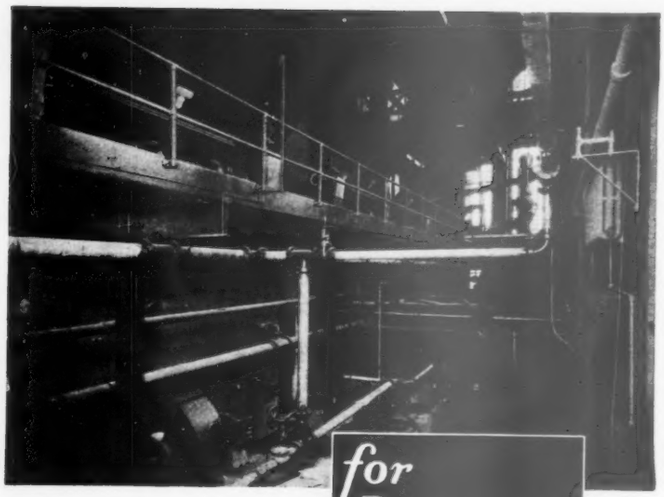
—and why just a few people get ahead."

The Lincoln Electric Co., Dept. 26-1, Cleveland, Ohio

"Stable Arc"

W-29

LINCOLN WELDER



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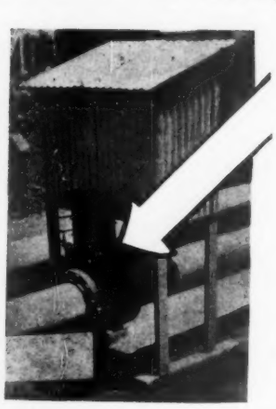

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ROBINSON ORIFICE FITTING

determination of the equilibrium endpoint of the gasoline alone (760 mm. partial pressure) with the black surface dew indicator is especially rapid, easy and reliable. Therefore Figure 6 was constructed in order to test whether the dew points of the different air-gasoline mixtures of any particular gasoline could be inferred from the experimentally determined equilibrium endpoint of the gasoline itself. The existence of such a relationship between dew points and the equilibrium endpoint would be demonstrated if the dew points of any particular air-gasoline ratio for various gasolines lay on a smooth curve.

For each gasoline the corrected values given in Table 6 were plotted against the equilibrium endpoint of that gasoline. All the points for the various gasolines corresponding to the same air-gasoline ratio fall upon a smooth curve. Thus the family of curves for the entire range of automobile operation was obtained. These curves are smooth and sensibly parallel. Figure 6 therefore expresses the relationship between the dew points and the equilibrium endpoint.

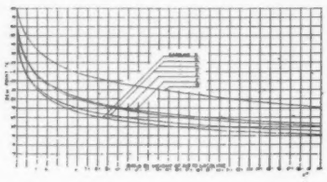


Figure 5—Relation between dew points of gasoline-air mixtures and equilibrium endpoint of gasoline alone.

Obviously, for similar gasolines one may deduce with practical correctness the dew points of any air-gasoline mixture from the experimentally determined equilibrium endpoint of gasoline at 760 mm. partial pressure. Therefore, the writers propose the determination of this point by means of the black surface dew indicator as the practical method for testing the volatility of gasolines. However, since the graph is empirical, the relation between the equilibrium endpoint of a fuel and the dew points of its air-fuel mixtures must be determined experimentally. Figure 6 applies to the commercial gasolines in the eastern section of the United States and probably with reasonable approximation to other gasolines.

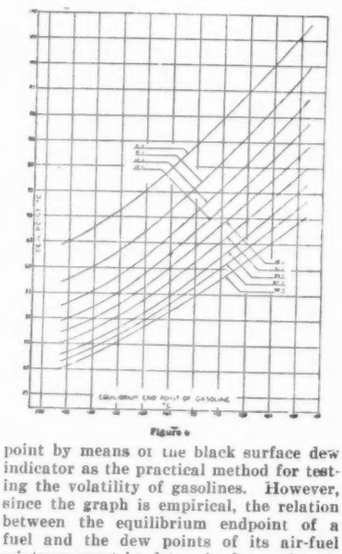


Figure 6

Acknowledgment

This research was done at the expense of the Deppe Motors Corp. with the active co-operation of its chief engineer, Charles E. Parsons.

CRUDE OIL DIESELS FOR USE IN AIRPLANES

NEW YORK, Jan. 14.—Dr. Elmer A. Sperry, inventor of the gyroscope compass, is reported to have an airplane engine on the Diesel principle said to be likely to revolutionize power plant design for airplanes and dirigibles.

Within a year, Doctor Sperry thinks, he will have a motor of 1,000 horsepower weighing 2 pounds to the horsepower and consuming crude oil instead of gasoline with a higher power development per gallon at one-fifth of fuel cost.

The Junkers Corp. in Germany and several engineers in France and England have been working on a development of this motor, but it is believed the handicap of weight is still to be overcome.

The Diesel motor differs from the ordinary gasoline engine in one very important factor. There is no spark. Combustion is obtained through the heat generated by compressing the air that goes into the mixture of oil for the fuel.

The most important feature of his engine, Doctor Sperry believes, is the substitution of heavy oil that is practically noninflammable for the volatile high compression gasoline. The elimination of the sparking system also is another safety factor.

"This new power for airplanes surpasses anything that we have at present from the standpoint of cost," Doctor Sperry said, "because there are three factors that insure this most important item. The cost of fuel is about one-fifth of the cost of the highly volatile aviation gas usually employed. Gallon for gallon it has one-third more vital force in it. We are enabled to give the same power by the use of only two-thirds the quantity by weight.

"But transcending all of these advantages is the complete elimination of all fire risk. Planes with this fuel may crack up and have the slightest danger of the burning of the plane, giving both the crew and rescuers full opportunity to extricate and extend first aid without interference."

The fuel oil employed in a Diesel engine is so completely noninflammable, Doctor Sperry said, that it was a good fire extinguisher. Experiments in which fuel oil thrown on an open fire put it out have been carried through at the Sperry Laboratories, he said.

The problem of overcoming the weight of the Diesel engine was solved gradually. The ordinary Diesel weighs about 100 pounds for each horsepower developed. The first engine Doctor Sperry built actually weighed that. Then he built an engine cutting the weight to 27 pounds per horsepower. The next experiment brought it to about 5 pounds per horsepower. The latest engine, which is now running, has brought the weight to the average weight of the most efficient aviation engines, 2 pounds to the horsepower.

The completed engine will consist of two banks of four cylinders each operating on a single crank shaft, somewhat similar in appearance to the Packard V shaped Liberty motor. Doctor Sperry believes the motor can be constructed in units of 100 horsepower.

AUTOS NOT READY FOR ADVANCE IN SULPHUR

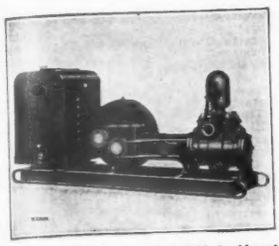
(Continued from Page 158)

ly on moderately heavy duty, even without thermostats or ventilators, practically no corrosion troubles will be experienced, even with fuels carrying up to 0.25 per cent of sulphur. Conversely, it is probably possible to develop corrosion troubles even on low-sulphur fuels on engines equipped with both thermostats and ventilators, if the service is sufficiently intermittent.

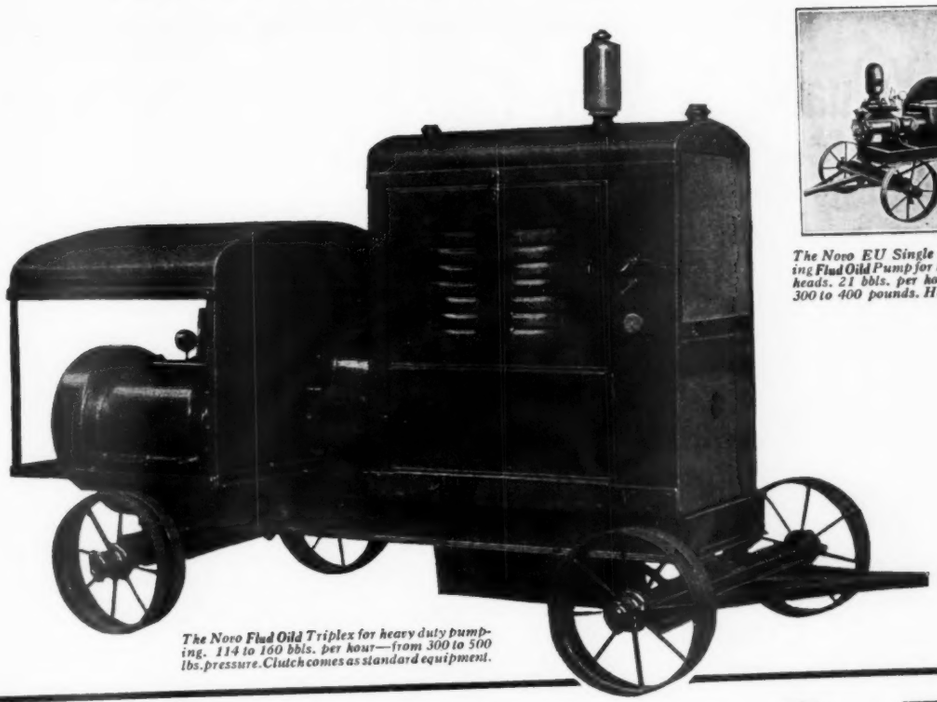
"6. The injurious effects of crankcase dilution are due largely to the effects of condensation of water, with the fuel dilution in most cases having only a minor effect.

"7. In a few years from now, when practically all the cars in the hands of the public will probably be provided with devices for combating corrosion and condensation of water, the changed conditions may make it desirable to consider seriously an increase in the sulphur content of the motor fuel.

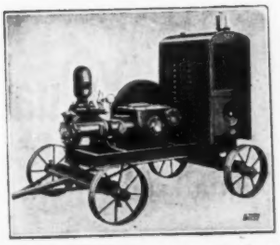
"8. Under present conditions, although the automobile engineers have made great advances in combating corrosion, an increase in the sulphur content of motor fuel is not in accord with the best interests of the automobile industry or the public."



The Novo EW Duplex ***Flud Oild*** *double acting Pressure Pump—for either oil or water. 50 to 160 bbls. per hour, up to 400 pounds pressure. Clutch comes as standard equipment on outfits powered with 4-cylinder engines. Equipped with spring loaded valves when ordered for oil pumping.*



The Novo ***Flud Oild*** *Triplex for heavy duty pumping. 114 to 160 bbls. per hour—from 300 to 500 lbs. pressure. Clutch comes as standard equipment.*



The Novo EU Single Cylinder, double acting ***Flud Oild*** *Pump for handling water at high heads. 21 bbls. per hour at pressures from 300 to 400 pounds. Has hydraulic packing.*

New Trouble-Free Portable Pumping—Out Where Trouble-Free Pumping Means Economy

In the New Novo Flud Oild Series you have three new Portable pressure pumps that give an unbelievable freedom from care, trouble, and high costs—pumps that can handle any capacity from 21 to 160 barrels per hour over any distance from 10 feet to 10 miles.

New Flud Oild Lubrication guards every gear, every crosshead—holds the hazards of wear and the power wastes of friction reduced to a minimum. And it virtually guarantees longer-lived pumping ability and far lower costs.

Because of this constant, thorough, unfailing lubrication, you can start a Novo Pump and practically forget it. The only attention it requires is an occasional inspection to see that the oil is kept at the proper level. It keeps a never-ending supply of water coming to your steam rig. And when used for oil gathering, the EW Duplex keeps the gathering pipes busy *every* minute it is in operation.

The coupon below will bring you detailed information on the new Flud Oild Series and a copy of the new Novo Pumping Handbook that shows what Novo Pumps are doing in every type of work. *Send it today.*

Flud Oild

The cover of the *dirt-proof* case has been removed to show you the crankshaft, bearings, gear, and pinion of the new Novo NT Triplex Pump—and the new Flud Oild lubricating system. This is the most advanced method of oiling heavy duty pressure pumps.

Two oil dippers (only one is shown) pick up the oil from the bottom of the crank case and throw it in flood-like streams into the reservoir under the intermediate shaft and pinion. Large ducts carry oil to the bearings, crossheads, and connecting rod ends. And the large crankshaft gear runs in oil at the bottom of crank case.

Every moving part is constantly, thoroughly flooded with oil. Every possibility of excessive, devastating wear is entirely eliminated.

NOVO ENGINE COMPANY, 240 Porter Street, Lansing, Michigan
CLARENCE E. BEMENT, Vice-Pres. & Gen. Mgr. Service parts and sales in over 60 cities

THE NEW NOVO FLUD OILD PUMPS

Pressure, Diaphragm, Centrifugal Pumps

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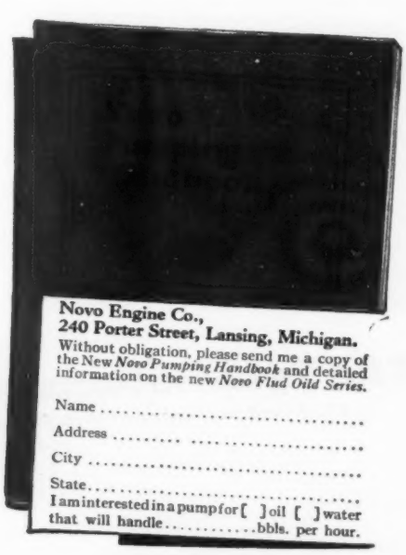

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Without obligation, please send me a copy of the New *Novo Pumping Handbook* and detailed information on the new *Novo Flud Oild Series.*

Name .....
Address .....
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I am interested in a pump for [ ] oil [ ] water that will handle .....bbls. per hour.

How Valuable Is Your Gas?

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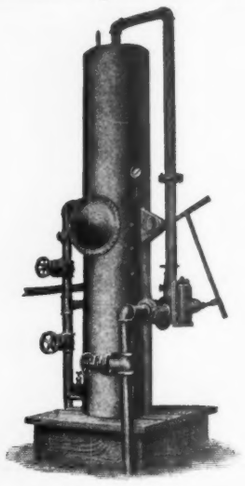

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NEW OIL FINANCING
$440,000,000 IN 1927

The oil industry engaged in new public financing to the extent of approximately $440,000,000 par value during 1927. Of this, some $417,800,000 was in bonds and the balance in stocks.

Included in the figures is $105,000,000, representing financing by subsidiaries of the Royal Dutch group. Shell Union Oil Corp. accounted for the largest individual issue of the year with its $50,000,000 of 5 per cent debentures. Shell Pipe Line Corp. sold $30,000,000 of 5 per cent debentures while another Royal Dutch subsidiary, Batavian Petroleum Co., sold $25,000,000 of 4½ per cent debentures. The Shell Union Oil issue was priced on a basis yielding slightly above 5 per cent; that of Shell Pipe Line about 5.14 per cent and the Batavian issue, about 4.85 per cent. It is estimated that all but about $25,000,000 of the $105,000,000 Royal Dutch financing will be spent on properties in the United States.

Other issues of the year included $42,000,000 of 5½s by Sinclair Crude Oil Purchasing Co.; $40,000,000 of 5¼ per cent debentures by Phillips Petroleum Co., $35,000,000 of 5 per cent debentures by Gulf Oil; $30,000,000 of 5s by Marland Oil; $30,000,000 of 5½s by Empire Oil & Refining; $18,000,000 of 5 per cent notes by Empire Gas & Fuel; $20,000,000 of 6s by Sinclair Consolidated Oil; $15,000,000 of 5½ per cent debentures by Skelly Oil and $12,000,000 of 5¼ per cent debentures by Continental Oil Co.

In many cases new financing was a reflection of unsettled conditions existing in the industry. Lower oil prices adversely affected earnings of many oil units. In some instances expansion or development of properties was arranged for from 1926 earnings, and new financing was instituted to capitalize such expenditures and to bolster up working capital. Liquidation of bank borrowings incurred in connection with oil storage and pipe lines necessitated some financing, while refunding of maturing obligations also accounted for part of the total.

The following table shows the principal bond issues during 1927:

Beacon Transport	$2,000,000
Batavian Petroleum Co.	25,000,000
California Petroleum	8,000,000
Continental Oil Co.	12,000,000
Empire Gas & Fuel	18,000,000
Empire Oil & Refining	30,000,000
Gulf Oil	35,000,000
Humble Oil & Refining	25,000,000
Independent Oil & Gas	6,500,000
Marland Oil	30,000,000
Phillips Petroleum	40,000,000
Pure Oil	20,000,000
Shell Union Oil	50,000,000
Shell Pipe Line Corp.	30,000,000
Sinclair Cons. Oil	20,000,000
Sinclair Crude Oil Pur.	42,000,000
Skelly Oil	15,000,000
Tide Water Assoc. Trans.	1,800,000
Warner Quinlan	2,500,000
White Eagle Oil	5,000,000
Total	$417,800,000

Issues of stock during the year included $5,000,000 by Pure Oil Co., $5,000,000 by Richfield Oil, $4,200,000 by Independent Oil & Gas, $4,500,000 by Sun Oil, $1,500,000 by Warner Quinlan, $700,000 by Bolivian Petroleum and $587,500 by Carib Syndicate.

WEST TEXAS FIELDS

DAILY AVERAGE PRODUCTION BY LEASES WEST TEXAS
Week Ending January 7, 1928

Company, Lease—	Wells	Bbls.
Crane County		
Church et al:		
University	1	75
Church & Weekly:		
University	3	1,192
Church & Fields:		
Duoll-Univ.	1	136
Eastland Oil & Collett:		
University	8	5,814
Gulf Prod. Co.:		
All leases	65	18,638
Humble O. & R. Co.:		
University	13	5,428
Independent O. & G. Co.:		
University-A	5	*936
University-B	1	*990
Landreth Prod. Corp.:		
Cowden-Anderson	16	10,939
Magnolia Pet. Co.:		
Univ.-Hardwicke	12	2,893
Univ.-O'Keefe	12	1,319
State-Lasseter	3	126
Magnolia et al:		
University	4	26
Pecos Oil Co.:		
University	13	*4,666
Prairie O. & G. Co.:		
University	5	366
State-Lasseter	5	*13,492
Simms & Atlantic:		
University-A	9	3,632
University-B	1	20
University-C	9	*10,201
University-D	11	*4,905
University-E	1	192
Stidham & Thrasher:		
University	1	16
The Texas Co.:		
University	1	244
Univ.-Beasley	1	50
Tidal Oil Co. et al:		
University-B	2	73
University-C	1	34
University-E	1	38
University-F	7	*2,686
University-G	3	*305
University-H	2	21
University-I	8	*4,913
Totals Church-Fields-McElroy Pool	225	94,440
Average per well		420
Miscellaneous Crane County		
Gulf Prod. Co.:		
Waddell	1	20
Independent O. & G. Co.:		
Hughes	1	5
McMan O. & G. Co.:		
Hughes	2	65
Marland Oil Co.:		
All leases	16	815
The Texas Co.:		
King	9	289
Union Land-F	1	0
Miscellaneous totals	30	1,172
Grand totals Crane County	255	95,632
Average per well		375
Pecos County		
Allsman & Bell:		
Pecos River Bed	3	147
California Co.:		
Yates, Lse. 1	7	8,192
Smith, Lse. 3	5	1,092
Gulf Prod. Co.:		
All leases	6	5,652
Humble O. & R. Co.:		
M. A. Smith	5	1,423
M. A. Smith-B	3	420
Kirby Pet. Co. & Edson:		
J. H. Tippett	1	0
Marland Oil Co.:		
Yates-A	10	1,557
Mazda Oil Co. & Savoy:		
M. A. Smith	1	137
McMan & Marland:		
Yates	14	5,402
Red Bank Oil Co.:		
Smith	2	259
Simms Oil Co.:		
Smith	3	4,756
Roxana Pet. Corp.:		
Tippett	5	5,085
Smith	2	119
Mid-Kansas & Transcont.:		
Yates-A	9	3,127
Yates-B	14	3,671
Yates-C	8	3,163
Yates-D	1	379
Yates-E	1	172
Smith-Taylor	6	4,368
Texon O. & L. Co.:		
Yates	2	0
Totals Yates Pool	108	49,162
Average per well		455

Note: All Pecos County wells partially pinched.

Winkler County		
Atlantic O. P. Co.:		
Grisham-Hunter	1	2,850
Ida Hendrick-A	1	400
Hendick-D	2	4,800
Cranfill & Reynolds:		
Ida Hendrick	1	5,500
Ida Hendrick-B	1	120
Gulf Prod. Co.:		
T. G. Hendrick	6	*4,826
Humble O. & R. Co.:		
Grisham-Hunter	1	*1,200
Ida Hendrick-B	2	*4,000
Independent O. & G. Co.:		
Grisham-Hunter	2	4,600
Hendrick	1	0
Ida Hendrick-B	1	252
Landreth Prod. Corp. & Roxana:		
Grisham-Hunter	2	5,400
Ida Hendrick-A	2	3,650
Magnolia Pet. Co.:		
Ida Hendrick	2	3,100
Murchison, Cranfill Bros. et al:		
Grisham-Huter-A	2	540
Grisham-Hunter-B	1	520
Grisham-Hunter-C	1	125
Republic Prod. Co.:		
Grisham-Hunter-A	1	3,300
Roxana Pet. Corp.:		
Grisham-Hunter-A	1	*850
Ida Hendrick-C	1	*2,510
Southern Crude O. P. Co.:		
T-67 Hendrick-A	1	215
T-67 Hendrick-C	4	2,600
T-67 Hendrick-F	1	1,850
T-88 Hendrick-B	1	5,030
T-89 Hendrick-A	1	20
T-67 Hendrick 3-A	1	dead
T-88 Hendrick-A	1	970
T-88 Hendrick-C	2	2,400
Texon O. & L. Co.:		
Grisham-Hunter-A	1	*1,290
The Texas Co.:		
Grisham-Hunter	2	700
Turman & Maxwell:		
Ida Hendrick	2	820
Roxana & Llano:		
Scarborough	1	20
Totals Winkler County	50	62,123
Average per well		1,262
Grand totals West Texas	1,224	260,795
Totals last week		267,068
Difference		6,310

*Production partially pinched.

BUREAU OF MINES FILMS

The San Francisco, Calif., office of the United States Bureau of Mines has been designated the Pacific Coast distributing center for the motion picture films of the bureau, and about 85 reels are now being carried in stock. Those desiring the loan of any of these films can secure information by addressing the United States Bureau of Mines, 506 Custom House, San Francisco, Calif.

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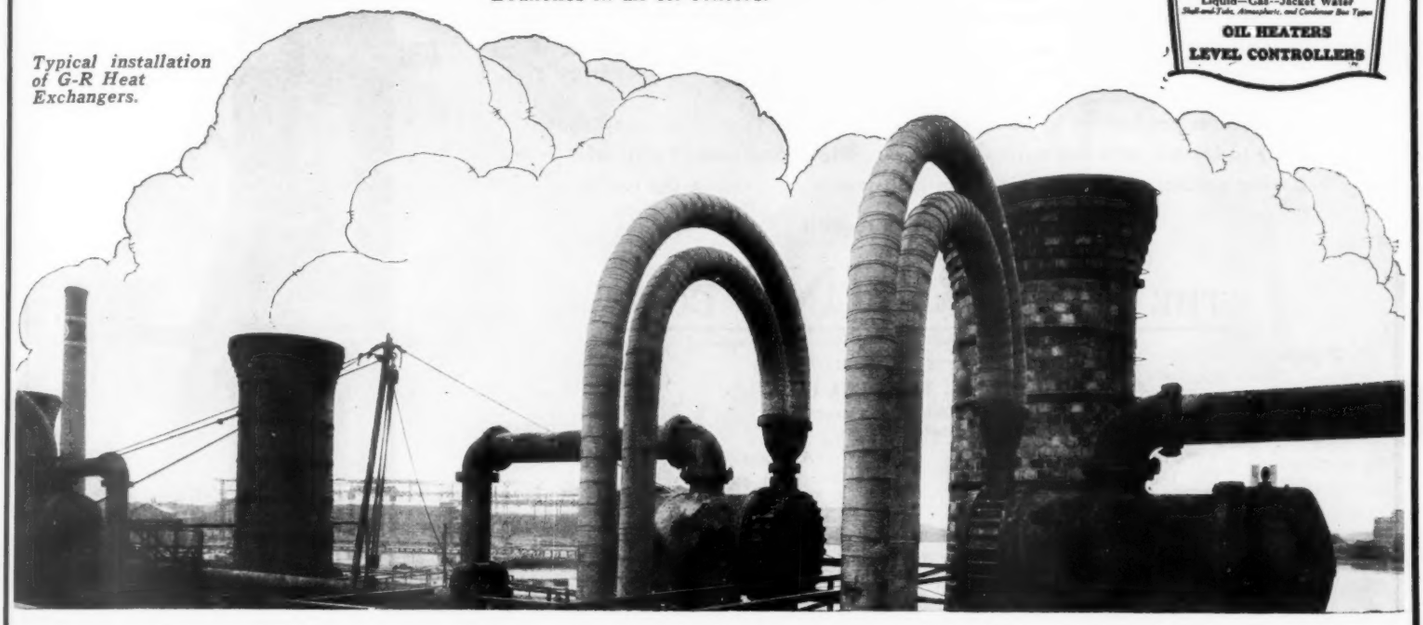
LEVEL CONTROLLERS

Typical installation of G-R Heat Exchangers.



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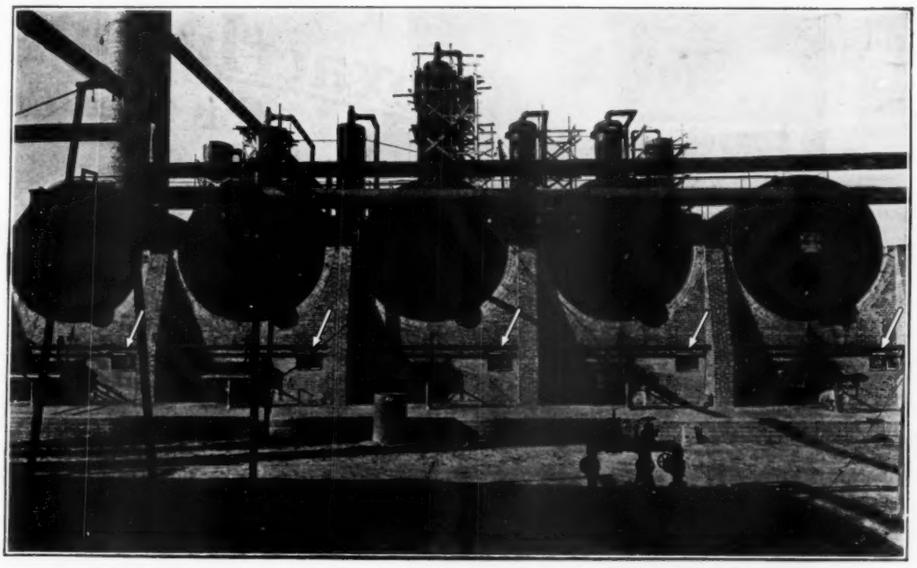
THIS is but one use for *Tycos* temperature instruments in the oil business. There are hundreds of others for in few other industries are the uses of heat so diversified and so important.



This illustration shows Tycos Recording Thermometers on a battery of crude oil stills.

Tycos temperature instruments have rendered excellent service for oil operators all over the world. They have been called upon to handle every temperature requirement. It is with confidence, therefore, that we recommend these sturdy, reliable instruments for your refinery.

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have time after time, in competitive tests with other types of separators, shown distinct savings which quickly repay their original cost.

It is the only one built having complete automatic and positive control of the gas and oil outlet valves. This prevents overflow and insures a perfectly clean separation.

It increases production by allowing a steady, natural flow of oil at all times.

Easy to install, with but minimum space required, and readily portable.

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WILLIAMS

The Rapiduction's Die-head has a capacity the full range of the machine. Small renewable dies are carried in large die holders. Takes only a few seconds to put in a new die.

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With the RAPIDUCTION your men cut each size thread at a maximum speed that represents the machine's full capacity. The wider range of spindle speeds *saves labor*, and *increases production 40%*.

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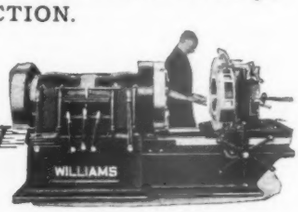
And this is only one of the RAPIDUCTION economies that you will like.

Write for Bulletin "O" which will give you a good idea of the *increased production* and *lower costs* you can get with the RAPIDUCTION.

Williams Tool Corp.
ERIE, PENNA.

WILLIAMS RAPIDUCTION
POWER PIPE and BOLT MACHINES



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In every section of the United States and in oil fields throughout the world, SPIRAL STEMS are in use to make crooked holes impossible.

Besides the advantage of forcing the bit to cut a straight, vertical hole, other features of the SPIRAL STEM are:

1. Prevents sucker rods from cutting tubing.
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3. Prevents mud-rings.
4. Cleans path for bailer.
5. Reduces whipping.
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72-76 Trinity Court, New York

SPIRAL STEM

You can't go wrong with a Tyco Tool

WANTS SALT WATER, SO DRILLS FOR IT

(Continued from Page 35)

ther refining is taken into the next building, the dryer building, of concrete and tile. Here it is dried in a special monel-lined rotary kiln.

Elevators then carry the dried salt (sodium chloride, or table salt) to the fourth and last of the series of salt buildings. This one, of brick and concrete, is the package building, where the salt is put up in cartons or bags for shipment.

Calcium chloride, bromine and iodine are recovered by chemical processes from the bittern or mother liquor after the salt has been removed in the spray pond. As already pointed out, the magnesium hydroxide is removed before the treated brine reaches the spray pond. The calcium chloride goes from the spray pond to the calcium plant.

Pete Palmer, driller (left), and Walter Freeman, tool dresser, never supposed they would come to this—drilling a well to get salt water.

Working Out New Processes

Large control and research laboratories are maintained in connection with the salt-producing plant, and various tests and experiments are conducted. Here, for instance, tests are made of the salt water from different strata as they are encountered in the well now being drilled. These tests are designed to ascertain what chemical products are derivable in commercial quantity. The laboratories are unusually well equipped and a stall is employed constantly developing improvements and working out new steps in the various processes employed.

Four salt-water strata already have been passed in the company's first well. Each differs slightly from the others in point of chemical constituents, but all, according to Doctor Martin and his assistants, are satisfactory for the company's purposes. Doctor Martin remarked that though salt-water samples had come from many quarters of the country, he wanted more, as the matter of deciding on the location of additional plants rested largely upon the quality of the salt water obtainable. "We'll be glad to receive and analyze salt water from any point," said Doctor Martin. "This is particularly important in view of the desire of this company to select sites for at least four other plants."

The first well of the company, which had reached a depth of 2,442 feet early this week, will be carried through, it was said, to the granite, expected at about 3,000 feet. A 15½-inch hole was drilled for 943 feet. Following this is 12½-inch casing for 325 feet into the Mississippi lime. Then come 8¼-inch and 6⅝-inch casing. Though each of the water strata already pierced was cased off with packer after the water had been tested, it is probable that upon completion of the well the water from all strata will be utilized in the manufacturing processes.

Five fishing jobs have marked the progress of the first well, three bits and two bailers having been lost. Each of these tools was recovered without serious interruption of work. Several fair showings of oil and gas have been cased off.

The well now nearing completion and the three others to follow it will increase greatly the capacity of the salt plant. The salt-water supply from oil wells in the

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No. 310—Capacity 15 tons
Single acting—automatic lowering

No. 310 is known as the Jack of a hundred uses. A standby in every oil field. Operates at any angle or vertically.

Built with drop forged steel working parts and furnished with five foot steel chain—steel auxiliary claw and steel level bar.

Unsurpassed for extricating stalled motor trucks—jacking steam engines—raising and setting boilers, raising sand reels and casing sills, skidding rigs and moving tanks and heavy machinery.

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Established 1899
Sole Manufacturers of the Simplex Jacks
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Simplex Jacks are extensively imitated but they never have been equaled in man-power, simplicity, stability or safety.

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Large gas companies, after using "Central" Pipe, have commented upon its uniform lengths, perfect roundness, and careful beveling. These sterling qualities in "Central" reduce construction costs by speeding up the field work and, in addition, insure a tight durable line.
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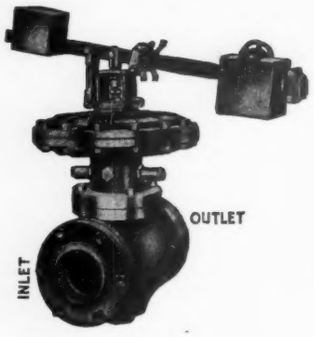
DISTRIBUTORS: Taubman Supply Corporation, Tulsa, Oklahoma, and branches; Dunigan Tool & Supply Co., Breckenridge, Texas, and branches; Putnam Supply Company, Putnam, Texas, and branches; Louisiana Iron & Supply Co., Shreveport, La., and branches; Petroleum Equipment Co., Los Angeles, California, and branches; American Supply Co., Mexia, Texas; Standard Supply Co., Inc., Wichita Falls, Texas.

Differential Gas-Relief Valve



When measuring gas with orifice meters, the Fulton Differential Gas Relief Valve, automatically turns them on and off, in conformity with the changes of flow. Gas companies which have not yet studied its operation are invited to write for descriptive catalogue, today.

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The OIL and GAS JOURNAL
PRODUCING REFINING MARKETING
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district already has become inadequate. The daily consumption of salt water will be 10,000 bbls. upon completion of the present expansion program. It is interesting to note that even on a carload, at wholesale market prices, the value of the chemicals taken from a barrel of salt water is much greater than the value of a barrel of oil.

Twelve Years of Study

In 1913, Doctor Martin, who then operated the Industrial Laboratories, with headquarters in Fort Smith, Ark., began a study of oil-field waters with a view of their commercial utilization. With his other chemists he conducted experiments which yielded valuable information on the subject of recovery of salts from oil-well brine but which he did not attempt to commercialize at that time. It was 12 years before Doctor Martin developed the processes to a point where he was satisfied to begin operations on a practical commerical scale.

The operation of the chemical processes at Sand Springs requires close affiliation with the Sand Springs electric power generating plant, and the two are interdependent to a great degree. Because of this, according to unofficial reports, the interests back of the Martin Process Co. have contracted to purchase all of the electric, gas and water properties of the Sand Springs Home. This reported transaction is understood to have involved an investment of almost $9,000,000.

"Our process is radically new in the chemical industry," said Doctor Martin. "They consist of a sequence of operations based upon well-known electrical, chemical and thermo-dynamic facts. By this process the latent heat of vaporization of steam at zero pressure on the absolute scale is completely recovered and applied to evaporation.

"In the most improved power plants approximately 80 per cent of the heat energy of steam is not recoverable. By our process this heat is recovered in its entirety and applied to evaporation. One of the leading evaporation engineers of the world has declared this process to be the most radical improvement in the art of evaporation in the last 100 years.

"It has been a matter of common knowledge in the chemical world for years that oil-field brine contained valuable minerals, but until the development of our process the amount of water to be evaporated to recover a given amount of the salts prohibited commercial exploitation."

Doctor Martin, who is 36 years old, began the study of chemistry and allied sciences at the age of 12. He received his college training at Hendrix College, Conway, Ark.; Arkansas University, Georgia School of Technology and Chicago University. Since finishing his college courses he has devoted his entire time to industrial scientific work.

MID-CONTINENT SCOUTS TO MEET AT GUTHRIE

The Mid-Continent Oil Scouts Association will hold its third annual convention at Guthrie, Oklahoma, April 27 and 28, according to an announcement received from that organization.

Friday, April 27, will be registration day. A banquet will be held in the evening, at which time a few papers will be read and short talks given by prominent speakers. The business session will be held at 10 o'clock the second day, followed by a luncheon. A golf tournament has been arranged for Saturday afternoon. A banquet and carnival dance Saturday evening will close the meeting.

The program committee is composed of Simon Crites of Bristow, G. W. Greenlee of Cushing and S. M. Blevins of Guthrie. All men engaged in scouting, land or lease work, contractors and producers are extended a cordial invitation.

Among other business transacted at the Board meeting was the conferring of honorary memberships upon all chief scouts, land department heads and their assistants, also upon a number of individuals, the majority of whom are former scouts. Representatives of the press and oil trade journals were voted honor-

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are fine for shutting in gas wells where over-size hole or soft formation exists."

Get a Parmaco *and be safe.*

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The Tret-O-litE method is the fast, economical and THOROUGH method of recovering oil from emulsions.

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Offices and Plant: Webster Groves, St. Louis County, Mo.

Eastern Service at Seminole

Seminole wells are deep and costly. Operators there need EXPERTS to do their shooting. Perhaps it is for that reason that we have been called upon to shoot nearly 100 wells there during the past weeks.

No matter if your wells are deep or shallow, they deserve the services of a good shooter. So call an Eastern EXPERT for that next shot.

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Owensboro, Ky. Shelby, Mont.
Casper, Wyo.

ary memberships at a previous meeting. Rex L. Dawson of the Carter Oil Co. was elected chairman of the board.

The officers of the association are: president, C. E. Savage, Carter Oil Co.; first vice-president, C. E. Hewitt, Mid-Continent Petroleum Corp.; second vice-president, R. T. Miller, Sinclair Oil Co.; and secretary-treasurer, Simon Crites, Phillips Petroleum Co. The board of directors is composed of the officers and one representative of each scouting district, as follows: H. H. Thoeming, Gypsy Oil Co., Tulsa; C. R. Piggott, Pure Oil Co., Ponca City; C. A. Barlow, Carter Oil Co., Seminole; H. N. Guthrie, Indian Territory Co., Shawnee; G. W. Greenlee, Mid-Continent Petroleum Corp., Cushing, and C. W. Michaels, Shaffer Oil & Refining Co., Okmulgee.

SHELL IS PURCHASING LINE RIGHT OF WAY

WICHITA FALLS, Tex., Jan. 14.—Shell Pipe Line Co. right of way buyers are purchasing line right of way in the Wichita Falls district for the company's 10-inch oil carrier from West Texas to Healdton, Okla., where it will intersect the Ozark Pipe Line Co.'s main line system to St. Louis, Mo.

It is believed the Shell company will be an active buyer of crude in the Wichita Falls district. It is reported to be in the final stages of a deal to buy some producing properties in the field.

The line will probably be completed the latter part of 1928. The Shell company has been carrying on construction work in short lines in West Texas as well as loading racks and will utilize these lines and racks until the major project is completed. The Healdton-St. Louis line was looped some time ago.

GULF CO. BEGINS WORK ON CARSON-GRAY LINE

AMARILLO, Tex., Jan. 14.—Gulf Pipe Line Co. has started construction work on a 24-mile 6-inch line from the Panhandle station in Carson County to the Gulf Production Co.'s Worley lease in the Wilcox-Pampa Pool of Gray County. A station will be built on the Worley lease and 4-inch laterals will be extended to the Gulf Production Co.'s six producing leases in Gray County which have a daily output of around 1,500 bbls. at present.

Gulf company will post prices for Gray County crude upon completion of the line which is expected to be finished about February 15. The Gulf company at present is handling only its own production in the Panhandle. Gulf Pipe Line Co. and Magnolia Pipe Line Co. are joint owners of a crude carrier south from the Panhandle to the Ranger district.

AMBROSE NOMINATED CHAIRMAN BY A.I.M.E.

Nominations for officers for 1928 of the Petroleum Division of the American Institute of Mining & Metallurgical Engineers have been made by the nominating committee as follows:

Chairman: A. W. Ambrose, Empire companies, Bartlesville, Okla.

Associate Chairman: C. R. McCollom, Union Oil Co. of California, Los Angeles, Calif.

Vice Chairman (Production Engineering): E. O. Bennett, Marland Oil Co., Fort Worth, Tex.

Vice Chairman (Production): Joseph Jensen, Associated Oil Co., Los Angeles, Calif.

Vice Chairman (Economics): Arthur Knapp, the United Gas Improvement Co., Philadelphia, Pa.

Vice Chairman (Research): Lester C. Uren, University of California, Berkeley, Calif.

Vice Chairman (Refinery Engineering): H. W. Camp, Empire companies, Tulsa, Okla.

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UNIFORM ACCOUNTING COMMITTEE CHANGES

In order to facilitate the future work of the A.P.I. Committee on Uniform Methods of Oil Accounting, it was decided by the group session at Chicago to ask that the committee be reduced to 11 members; 5 being selected regionally and 6 selected at large.

The five selected regionally will serve as chairman of subcommittees selected from companies and individuals in the region from which they are appointed; these subcommittees to have meetings during the current year and thereafter to pass upon the detailed schedules of revenue and expense accounts and fixed asset accounts and to consider any other accounting matters.

The personnel of this new committee is as follows:

Eastern Region: H. F. Davis, Standard Oil Co. of New Jersey, New York City.

Appalachian Region: F. S. Reitzel, the Sun Oil Co., Philadelphia, Pa.

Mid-Continent Region: George F. Winters, Phillips Petroleum Co., Bartlesville, Okla.

Texas-Louisiana Region: Ira McFarland, The Texas Company, Houston, Tex.

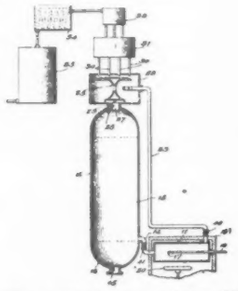
California Region: George H. Forster, Union Oil Co. of California, Los Angeles, Calif.

Members at Large

H. A. Gidney, Gulf Oil Corp., Pittsburgh, Pa.; B. W. Letcher, Standard Oil Co. of California, San Francisco, Calif.; C. H. Jay, Pure Oil Co., Chicago, Ill.

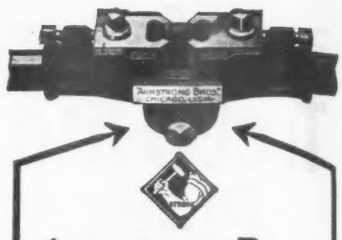
Recent Patents

1,652,344. Method and Apparatus for Cracking Oils. William Brink, Henryetta, Okla. Filed March 3, 1925. Serial No. 12,967. Three claims. (Cl. 196—48.)



1. The method of cracking different grades of mineral oil which consists in subjecting the oil in a cracking chamber to a cracking temperature appropriate to the grade of oil ranging roughly from 475 degrees Fahrenheit for straight crude oil to in excess of 1,000 degrees Fahrenheit for heavy fuel oils, agitating the oil by passing it through a closed system, maintaining the pressure in said system of approximately 50 pounds per square inch, passing the mixture of cracked and uncracked oil to a vertically disposed baffle to separate there the gaseous portions from the liquid portions of the treated mixture, cooling and condensing the gaseous portion, returning the heavier portion of the condensed gases to the system and retaining the lighter portions of the gases as finished product, causing the liquid portion from the baffle to fall by gravity through space to the main body of the liquid, slowing the movement of a portion of the oil in the system to enable it to deposit carbon in a settling basin and withdrawing oil from said slow moving body of oil at a point appreciably above the settling basin and passing it to the cracking chamber.

1,654,347. Oil Still. John Primrose, Dongan Hills, N. Y., assignor to Power Specialty Co., New York, N. Y., a cor-



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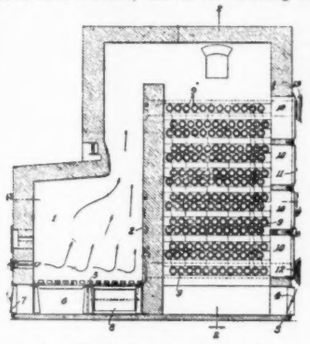
TEXAS OIL MAPS
County and District Catalog on Application
HEYDRICK MAPPING COMPANY
Wichita Falls, Texas

Always Renew Your Subscription Promptly

poration of New York. Filed December 28, 1920. Serial No. 433,588. 3 Claims. (Cl. 196—116.)

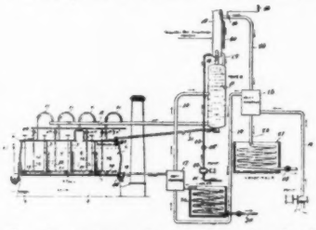
1. In an oil still of the kind described, the combination with a fire chamber having a checkered bottom, a combustion zone disposed at a point, spaced from and above said bottom, means for forcing air



through said bottom to reduce the temperature of the hot gases of combustion after combustion has taken place, said bottom serving to uniformly distribute said air in said products of combustion, a bridge wall, and a bank of oil pipes placed back of the bridge wall over which pipes the hot gases of combustion and the introduced and uniformly mixed air flow downward and counter to the current of oil passing through the pipes, said bridge wall and supplementary air co-operating to prevent overheating of the oil passing through said pipes.

2. In an oil still comprising a fire chamber and a heating chamber, said heating chamber receiving hot gases from the fire chamber, a bank of tubes in the heating chamber, each tube having a cast iron envelope, the outside surfaces of the different tubes at various locations varying inversely as the temperature of the gases impinging thereon, said tubes adjacent the walls of the heating chamber at points of low gas velocity .... having said casings with a greater surface there.. ..... on the casings on certain of the tubes nearer the center of said chamber at points of relatively higher gas velocity.

1,653,431. Distillation of Petroleum Oils. Richard W. Hanna, Piedmont, and Richard J. Hanna, Burlingame, Calif., assignors, by mesne assignments, to Standard Oil Co. of California, San Francisco, Calif., a corporation of Delaware. Filed October 2, 1922. Serial No. 591,773. 5 Claims. (Cl. 196—72.)



5. A process of continuously distilling a petroleum oil comprising continuously vaporizing the oil, continuously passing the evolved vapors through a three stage vapor separating system, in the first stage of which the vapors are subjected to the condensing action of the feed oil to the system and the condensate from the other stages, in the second stage of which the vapors are subjected only to the condensing action of the condensate from the third stage, and in the third stage the vapors are brought to a desired discharge temperature by controllably dissipating heat thereof to a separate liquid cooling medium the temperature of which is controlled without varying the character of the feed oil maintained at its boiling point, the feed oil together with the condensate from such vapor separating system being passed to the source of evolved vapors, and condensing as one product the vapors from such vapor separating system, said process being characterized by the separation of no intermediate product.

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS

Pipe Line Statement for November

Runs

	Month	Dy. Av.
*Prairie Pipe Line Co.	4,470,000	149,000
Gulf Pipe Line Co.	1,620,453	54,015
Texas Pipe Line Co.	1,314,796	43,826
Empire Pipe Line Co.	1,344,761	44,825
Magnolia Pipe Line Co.	2,045,554	68,185
Cosden Pipe Line Co.	1,059,003	35,300
Sinclair Pipe Line Co.	2,752,710	91,757
Oklahoma Pipe Line Co.	3,871,727	129,057
*Other lines	7,918,273	263,943
Total November	26,397,277	879,908
Total October	27,729,663	894,506
Difference	1,332,386	14,598

Shipments

*Prairie Pipe Line Co.	5,460,059	182,002
Gulf Pipe Line Co.	1,367,493	45,583
Texas Pipe Line Co.	974,190	32,473
Empire Pipe Line Co.	1,250,114	41,670
Magnolia Pipe Line Co.	1,837,349	61,245
Cosden Pipe Line Co.	867,939	28,931
†Sinclair Pipe Line Co.	2,938,888	97,963
Oklahoma Pipe Line Co.	3,629,478	120,982
*Other lines	7,590,522	253,018
Total November	25,916,037	863,867
Total October	26,128,011	842,838
Difference	211,974	21,029

Stocks

*Prairie Oil & Gas Co.	31,700,000
*Prairie Pipe Line Co.	2,500,000
Gulf Pipe Line & Gypsy Oil Co.	10,126,654
The Texas Company	5,513,789
Empire Pipe Line Co.	4,577,545
Cosden Pipe Line Co.	3,447,632
*Sinclair Crude Oil Pur. Co.	20,550,000
Magnolia Petroleum Co.	6,946,641
Oklahoma Pipe Line Co.	2,970,487
Carter Oil Co.	15,959,813
*Other lines	10,560,000
Total November	114,952,561
Total October	111,418,650
Difference	3,433,911

*Estimated. †Prairie shipments include Texas crude oil and Sinclair shipments include Texas and Wyoming crude oil.

Note: Stocks do not include approximately 5,200,000 bbls. of crude oil held in storage on private tank farms and leases and 2,000,000 bbls. of Texas Panhandle crude oil in storage in Oklahoma and Kansas.

EASTERN PIPE LINES

Runs From Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for October and November.

Buckeye P L	Oct. '27	Nov. '27
Nat. Transit	153,605.94	138,601.66
S W Pa P L	82,744.33	85,325.67
Eureka P L	285,550.68	264,643.37
(Mackb'g)	317,058.69	314,900.41
Buckeye P L (Clev)	10,997.15	12,030.90
Buckeye P L (Lima, etc)	125,719.20	105,956.52
Indiana P L	8,595.58	7,189.17
Cum'land P L	243,106.02	236,613.60
N Y Transit	23,121.86	21,173.39
Tidewater P L	189,161.99	182,622.58
Pure Oil	161,298.70	152,816.95
Emery P L	55,417.68	56,468.37
Paragon Dev.	26,098.63	27,069.78
Stoll Oil Ref.	.....	12,843.77
Total	1,782,476.45	1,718,256.14
Daily Avg.	57,499.24	57,275.20

Note—Indian Refining Co. also reported other receipts of 241,754.30 bbls. Paragon Refining Co. had other receipts of 167,197.21 bbls. Paragon Development had other receipts of 1,496.95 bbls. Pure Oil had other receipts of 10,281.87 bbls.

Petroleum Deliveries

The following tables exhibit the shipments of regular deliveries of various pipe lines in New York, Pennsylvania and Indiana for October and November.

	Oct. '27	Nov. '27
Nat. Transit	412,898.65	319,056.21
S W Pa P L	396,020.73	375,867.86
Eureka P L	181,662.67	192,438.78
Buckeye P L (Mackb'g)	174,666.60	152,463.55
Buckeye P L (Cleve)	879.27	969.42
Buckeye P L (Lima, etc.)	904,624.25	1,013,132.41
Indiana P L	914,394.35	1,116,002.96
Cum'land P L	148,084.33	145,443.98
N Y Transit	263,563.56	175,265.57
Northern P L	190,733.21	178,350.74
Tidewater P L	157,876.88	111,596.80
Pure Oil	185,726.83	177,184.58
Emery P L	56,581.89	54,750.52
Paragon Ref.	165,399.67	168,246.24
Indian Ref	379,151.78	319,181.35
Paragon Dev.	25,962.84	29,362.95
Total	4,568,028.00	4,529,263.92
Daily Avg.	147,036.39	150,975.46

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky at the close of October and November.

	Oct. '28	Nov. '27
Nat. Tran.	1,075,415.42	1,103,601.66
S W Pa P L	690,516.74	715,534.91
Eureka P L	1,712,937.61	1,729,737.61
Buckeye P L (Mackab'g)	393,929.95	396,287.92
Buckeye P L (Cleve)	54,908.39	50,691.02
Buckeye P L (Lima, etc.)	4,863,379.96	4,695,838.16
Indiana P L	666,852.50	647,290.51
Cum'land P L	621,345.31	594,822.46
Southern P L	441,618.38	386,756.90
N Y Transit	436,043.71	519,190.02
Northern P L	541,552.22	547,199.31
Pure Oil	410,038.20	390,386.96
Emery P L	11,001.49	12,543.82
Paragon Ref	13,919.16	13,179.46
Indian Ref.	106,017.05	129,403.33
Paragon Dev.	8,185.55	7,276.88
Total	12,047,660.64	11,939,740.93
Increase	165,055.79	.....
Decrease	.....	107,919.71

Grades of Oil

The following table shows the amount of the different grades of oil held by the Eastern pipe lines at the close of October and November showing the gross stocks of the above fields:

	Oct. '27	Nov. '27
Pennsylvania	4,160,309.06	4,076,710.10
Lima	1,149,122.63	1,177,864.75
Kentucky	1,065,864.24	1,089,857.44
Mid. Cont.	5,576,783.90	5,519,125.98
Illinois	95,580.81	76,182.66
Total	12,047,660.64	11,939,740.93

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1924	1925	1926	1927
Jan.	62,628	56,831	55,630	56,209
Feb.	64,022	60,606	60,294	61,298
March	64,721	60,575	61,644	63,247
April	71,958	63,062	63,019	60,337
May	63,942	59,217	60,581	60,284
June	63,230	61,270	64,131	62,757
July	64,208	62,639	63,206	58,574
Aug.	59,942	59,686	61,815	60,870
Sept.	62,930	62,510	64,639	60,285
Oct.	64,976	60,995	62,704	57,499
Nov.	66,282	59,350	61,774	57,275
Dec.	65,814	57,974	58,775	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1924	1925	1926	1927
Jan.	145,518	157,849	156,056	141,227
Feb.	148,732	160,863	159,488	138,584
March	147,098	164,591	160,239	133,777
April	147,614	151,439	152,371	149,230
May	134,997	146,995	160,998	144,394
June	143,010	149,467	160,257	149,772
July	124,187	161,338	160,275	151,350
Aug.	123,120	161,730	151,929	138,658
Sept.	127,325	156,719	158,915	144,213
Oct.	123,170	145,388	161,132	147,036
Nov.	124,400	143,582	152,668	150,975
Dec.	151,392	159,162	136,428	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1925	1926	1927
Jan.	11,353,276	9,859,170	9,718,902
Feb.	11,192,924	9,579,354	10,119,162
March	11,158,297	9,438,292	10,794,044
April	11,062,082	9,805,851	11,112,295
May	11,207,562	9,631,757	11,359,381
June	11,093,796	9,585,864	11,492,672
July	11,067,463	9,734,687	11,453,128
Aug.	10,974,481	9,118,947	11,989,115
Sept.	10,781,753	9,433,732	12,212,716
Oct.	11,086,850	9,269,806	12,047,661
Nov.	11,068,158	9,257,667	11,939,740
Dec.	10,458,445	9,454,512	.....

Franklin Pipe Line Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above.

	Runs	Shipments	Stocks
1926—			
Nov.	2,810.60	1,664.55	15,817.31
Dec.	2,847.52	5,561.11	13,103.72
1927—			
Jan.	2,641.54	1,470.42	14,274.84
Feb.	2,764.30	1,082.82	15,956.32
March	2,587.20	1,878.56	16,664.96
April	2,834.23	1,512.65	17,986.54
May	2,768.48	539.29	20,215.72
June	2,946.29	664.40	22,497.61
July	3,153.39	1,271.61	24,374.39
Aug.	3,057.89	8,713.11	18,719.17
Sept.	3,309.56	2,656.48	19,372.25
Oct	2,801.32	1,226.99	20,946.58
Nov.	2,746.50	2,220.53	21,472.55

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, December 1	2,107,942.25
Other receipts	577,687.68
Runs from wells	291,284.39
Regular deliveries	354,406.56
Other deliveries	474,876.27

The amount of Illinois oil run by the Tidewater Pipe Co. in November was 37,933.46 bbls. and deliveries were 60,778.50 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1926—	Runs	Deliveries
November	651,263.33	498,439.37
December	668,909.58	587,947.61
1927—		
January	621,421.03	530,085.98
February	595,831.16	476,950.71
March	727,593.91	564,947.43
April	593,225.97	444,818.49
May	728,759.40	543,192.02
June	640,975.85	532,217.78
July	613,901.30	484,902.53
August	651,276.40	529,831.27
September	619,589.49	433,212.49
October	601,099.25	408,287.52
November	605,621.14	416,186.06

Tidewater Pipe Co., Ltd., also delivered in November 263,645.39 bbls. of Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS						
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total All Ports
July	13,484	27,290	23,065	9,129	5,451	78,419	.....	.....	.....	.....	968	79,387
August	16,516	3,065	48,129	17,323	26,000	113,032	.....	.....	.....	.....	.....	113,032
September	23,033	6,967	51,400	14,567	19,533	115,500	.....	.....	.....	.....	.....	115,500
October	20,936	4,355	47,968	14,129	14,387	101,774	.....	.....	.....	.....	.....	101,774
November	9,433	2,833	23,033	15,166	4,933	55,400	.....	.....	.....	.....	.....	55,400

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	ATLANTIC PORTS						GULF COAST PORTS						
	Baltimore	Boston	New York	Philadelphia	Others	Total	Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total All Ports
July	22,226	10,387	80,193	7,193	38,710	158,710	3,226	25,065	806	.....	29,096	187,806
August	19,323	9,032	80,903	14,258	31,821	155,387	2,097	21,161	.....	.....	23,258	178,645
September	28,033	11,433	85,500	12,800	37,700	175,467	6,667	19,233	.....	3,600	28,500	203,967
October	26,064	13,097	79,355	3,838	34,097	156,451	1,613	19,323	806	1,871	23,613	180,064
November	35,233	8,033	84,533	30,100	27,067	184,967	4,000	26,500	2,000	1,667	34,167	219,133

GROSS PRODUCTION OF THE UNITED STATES FOR 12 MONTHS

(IN BARRELS)

		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mountains	Eastern Fields	Total
1926—										
December:	Month	20,276,950	17,882,908	19,753,591	3,654,156	4,266,189	2,018,734	2,658,301	3,313,000	73,823,829
	Daily average	654,095	576,868	637,212	117,876	137,619	65,120	85,752	106,871	2,381,414
1927—										
January:	Month	20,184,872	19,035,426	18,605,363	3,769,379	4,076,469	1,905,570	2,620,303	3,332,500	73,530,382
	Daily average	651,125	614,046	600,173	121,609	131,499	61,470	84,203	107,500	2,371,948
February:	Month	17,982,711	19,752,348	16,483,712	3,352,076	3,574,256	1,784,104	2,385,135	3,007,200	68,321,542
	Daily average	642,240	705,441	588,704	119,717	127,652	63,718	85,183	107,400	2,440,057
March:	Month	19,835,724	22,480,921	18,232,617	3,675,143	3,853,920	2,032,982	2,476,798	3,335,800	75,923,905
	Daily average	639,862	725,191	588,149	118,553	124,320	65,580	79,574	105,100	2,449,158
April:	Month	19,493,825	22,208,130	17,801,140	3,516,939	3,378,240	1,994,330	2,616,779	3,474,000	74,482,365
	Daily average	648,870	740,271	593,371	117,231	112,608	66,491	87,193	115,800	2,482,745
May:	Month	19,506,054	23,258,463	19,539,682	3,704,314	3,493,669	1,935,175	2,742,588	3,467,000	77,646,346
	Daily average	629,228	750,273	630,293	119,494	112,699	62,425	88,471	111,839	2,504,721
June:	Month	19,181,442	22,830,330	18,299,810	3,437,580	3,365,760	1,880,820	2,592,437	3,330,000	75,018,179
	Daily average	639,381	761,011	613,327	114,586	112,192	62,694	86,414	111,000	2,500,606
July:	Month	19,319,031	26,522,546	17,607,194	3,464,082	3,406,683	2,279,405	2,635,607	3,373,000	78,597,538
	Daily average	623,194	855,566	567,974	111,422	109,893	73,529	85,020	198,506	2,535,401
August:	Month	19,279,131	26,283,350	17,715,229	3,424,570	3,242,600	2,100,905	2,630,065	3,608,400	78,282,250
	Daily average	621,907	847,850	571,459	110,470	104,600	70,964	81,615	116,400	2,526,040
September:	Month	19,064,500	24,111,660	18,822,800	3,342,240	3,032,970	2,027,070	2,228,604	3,466,000	75,604,849
	Daily average	635,483	803,722	610,760	111,408	101,099	67,569	74,620	115,500	2,516,828
October:	Month	19,448,893	24,223,803	19,202,136	2,509,169	3,117,300	2,056,159	2,270,905	3,565,000	77,394,365
	Daily average	627,384	781,413	619,456	113,199	100,555	66,339	73,255	115,000	2,496,601
November:	Month	18,516,467	23,083,330	18,636,390	3,312,870	2,906,760	1,947,660	2,274,870	3,330,000	74,008,397
	Daily average	617,216	769,444	621,213	110,429	96,892	64,921	75,829	111,000	2,466,947
	Total 12 months	232,089,590	271,673,805	220,500,045	42,155,069	41,714,816	24,061,914	30,041,283	40,600,500	902,635,027
	Daily average	635,863	744,319	604,110	114,488	114,287	65,923	82,345	111,234	2,472,978

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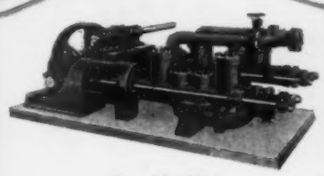

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